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Vol. 974 Number 2

OFFICIAL GAZETTE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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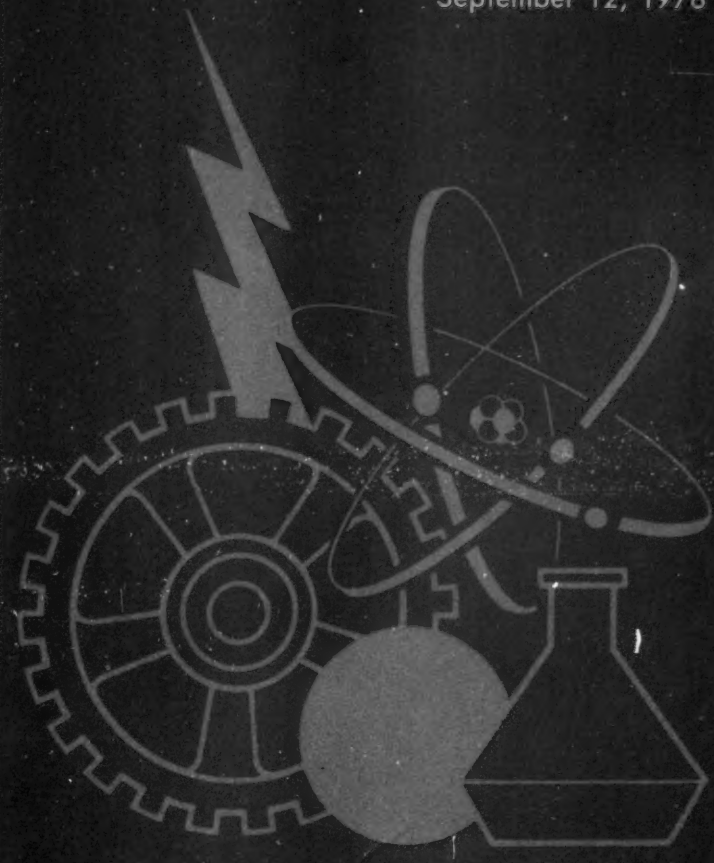

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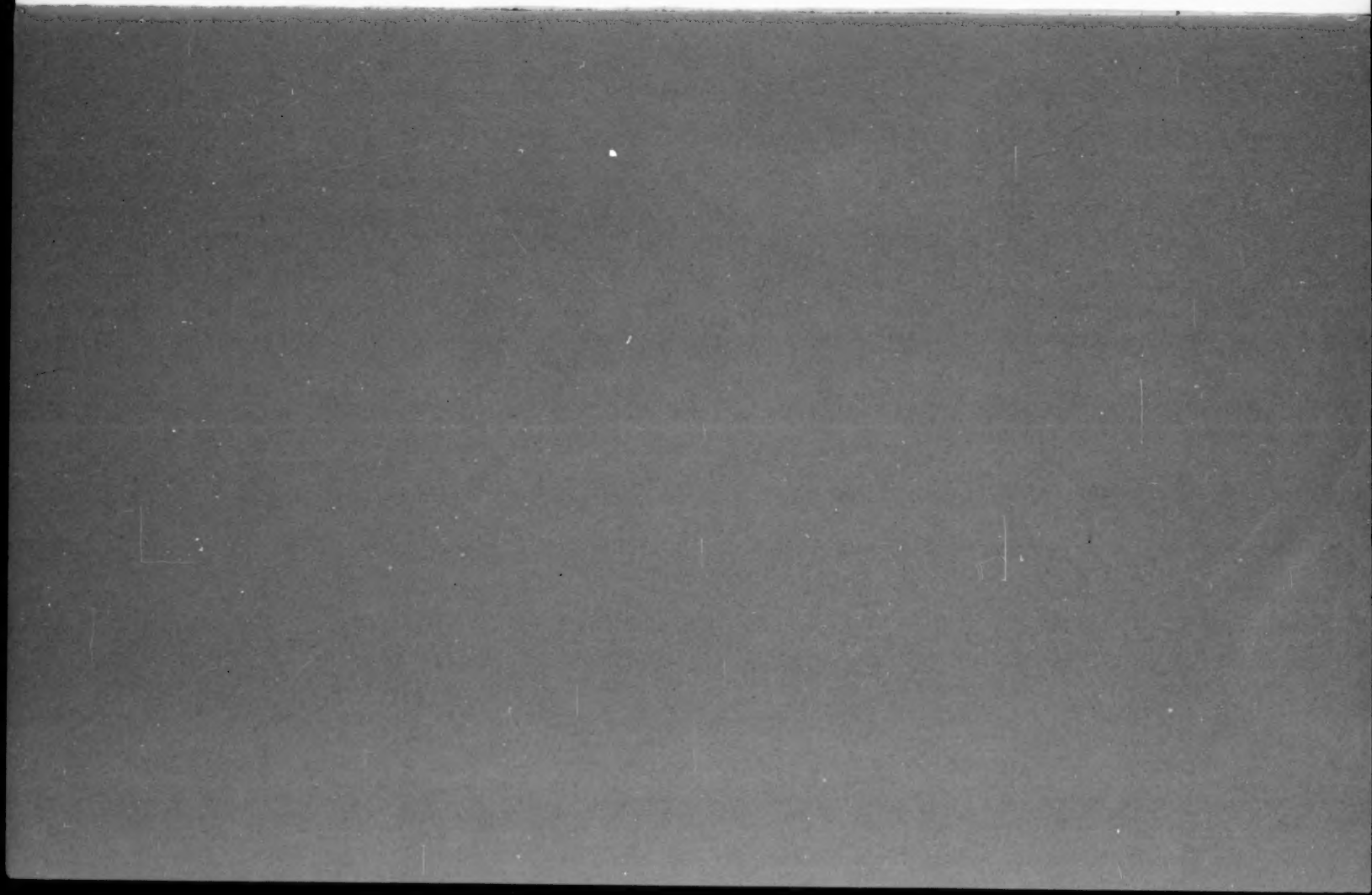

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

September 12, 1978 Volume 974 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

Chapter I—Patent and Trademark Office, Department of Commerce

PART 2—RULES OF PRACTICE IN TRADEMARK CASES

Late Filed Fees for Section 8 Affidavits/Declarations and Notices of Opposition in Trademark Cases

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final rule.

SUMMARY: This notice adopts rule changes which permit the acceptance of late fees in connection with notices of opposition and affidavits or declarations under § 8 of the act of July 5, 1946, as amended. These changes eliminate the need for petitioning the Commissioner for acceptance of such late fees. Under these changed rules, the Office will notify parties of the missing or deficient fees and provide for the acceptance of the appropriate fee within a designated time period upon payment of a service charge.

EFFECTIVE DATE: September 11, 1978.

FOR FURTHER INFORMATION CONTACT: J. Paul Williamson, Patent and Trademark Office, 703–557–2521.

SUPPLEMENTARY INFORMATION: On February 2, 1978, the Patent and Trademark Office published for comments a proposal (43 FR 4441, FR Doc. 78–2922) to revise §§ 2.1, 2.6, 2.101 and 2.162 of title 37 of the Code of Federal Regulations. Ten written comments were received in connection with the proposed changes and these written comments, together with an analysis of the comments, are available for public inspection in room 11E10 of Crystal Plaza Building 3, 2021 Jefferson Davis Highway, Arlington, Va. All comments were given careful consideration in the preparation of these final rules.

The only comment received which opposed the proposed rulemaking expressed the opinion that timely payment of a fee for at least one class was mandated by the statute in connection with an affidavit or declaration under § 8 and with an opposition.

Section 31 of the statute sets the required fees for the majority of activities in the Trademark Operation. However, it was held in "In re Kleiner," 185 USPQ 362 (Comr. Pat. 1975) that this section of the statute does not preclude the payment of a fee beyond the time allowed for filing a § 8 affidavit or declaration. Section 31 is not construed to require the "timely" filing of any fee. That section only determines the amount of the fee which must be paid. When the necessary fee must be paid is determined from other sections of the statute, that is, the particular sections dealing with the activity for which a fee is required.

Section 8 of the statute makes no reference to a fee and therefore there is no statutory mandate regarding the timeliness of such fee. Likewise, § 13 of the Statute does not preclude the payment of the required fee beyond the time allowed for filing the opposition. See *"Colgate-Palmolive Co.* v. *Brenner, Comr. of Pats."*, 148 USPQ 535 (S.D.N.Y. 1965) and *"Marzall, Comr. of Pats.* v. *Libby, McNeill and Libby,"* 89 USPQ 10 (D.C. Cir. 1951).

Finally, the comment opposing the rules changes expressed the concern that these changes may increase the administrative burden on the Patent and Trademark Office and, in a sense, encourage inattention to compliance with the act and the rules by some parties. With respect to the administrative burden on this Office, it is believed that the new procedures can be handled more efficiently and with less burden on the Office than the petition process now requires. Furthermore, as indicated in the proposed rules notice, the handling of such fees is considered to be of a ministerial nature and it is not believed that substantive rights should be immediately denied due to a failure to comply with a requirement of that nature. However, where the proposed procedure is not complied with, relief by way of petition to the Commissioner will require that the stringent standards of § 2.148 be satisfied.

One of the comments favoring the proposed changes also recommended that § 2.85(e) be amended to delete reference to the § 8 and opposition fees and to incorporate the concept of that rule into §§ 2.101 and 2.162. The basis of this suggestion was that the concept of § 2.85(e) does not logically fit with the other elements of § 2.85 and since changes are being made with §§ 2.101 and 2.162, it would make better sense to add this concept to those rules. While there is merit to the suggestion that the concept of § 2.85(e) does not logically fit with the other elements of § 2.85, it is believed that attorneys and other parties regularly practicing before this Office are now well aware of § 2.85(e). In those cases where parties are not aware of § 2.85(e), the Office notification of a deficiency of fees for the number of classes involved sufficiently alerts parties such that no prejudice results rom the "location" of the concept within the rules themselves. Therefore, rather than trying to embody the concept in five different rules covering fees for appeals, oppositions, cancellations, renewals and § 8 affidavits or declarations, it is considered more efficient to leave § 2.85(e) as is. However, the suggestion of this commenter that the revision to § 2.1 should include a reference to § 2.85(e) is valid and that change has been incorporated into the final rule.

Accordingly, pursuant to the authority contained in §§ 31 (b) and 41 of the act of July 5, 1946, as amended, the proposed amendments to the rules of practice, with the change noted above, are adopted as set forth below.

1. By revising § 2.1 to read as follows:

§ 2.1 *Sections of Part 1 applicable.*

Section 1.1 to 1.26 of this chapter are applicable to trademark cases except such parts thereof which specifically refer to patents and except § 1.22 to the extent that it is inconsistent with §§ 2.85(e), 2.101(c) or 2.162(d). Other sections of part 1 incorporated by reference or referred to in particular sections of this part are also applicable to trademark cases.

2. By the addition of new paragraph (g) to § 2.6 to read as follows:

§ 2.6 *Trademark fees.*

* * * * *

(g) For the special service of handling late filed fees in connection with an:

Affidavit or declaration under § 8	10.00
Opposition	25.00

* * * * *

3. By the addition of new paragraph (c) to § 2.101 to read as follows:

§ 2.101 *Filing an opposition.*

* * * * *

(c) If no fee, or a fee insufficient to cover at least one class, is filed within 30 days after publication of the mark to be opposed or within an extension of the time for filing an opposition, the opposition will not be refused if the required fee(s) and service charge (see § 2.6(g)) are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office. In situations covered by this paragraph, § 2.85(e) may not be utilized.

4. By revising paragraph (d) of § 2.162 to read as follows:

§ 2.162 *Requirements for affidavit or declaration during sixth year.*

* * * * *

(d) Include the required fee for each class to which the affidavit or declaration pertains in the registration. If no fee, or a fee insufficient to cover at least one class, is filed before the expiration of the sixth year following the date of registration or of publication under § 12(c) of the act, the affidavit or declaration will not be refused if the required fee(s) and service charge (see § 2.6(g)) are filed in the Patent and Trademark Office within the time limit set forth in the notification of this defect by the Office. In situations where a notice of deficiency is sent because no fee, or a fee insufficient to cover at least one class, is filed, § 2.85(e) may not be utilized. If insufficient fees are included to cover all classes in the registration, the particular class or classes to which the affidavit or declaration pertains should be specified;

* * * * *

Dated: July 28, 1978.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Approved:

FRANCIS W. WOLEK,
Acting Assistant Secretary for Science and Technology.

[FR Doc. 78-22330; Filed 8-9-78; 8:45 am]

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,676,921, Re. S.N. 908,846, Filed May 23, 1978, Cl. 29/571, SEMICONDUCTOR DEVICE COMPRISING AN INSULATED GATE FIELD EFFECT TRANSISTOR AND METHOD OF MANUFACTURING THE SAME, Else Kooi, Owner of Record: by mesne assigmts. to *U.S. Philips Corporation, New York, N.Y.,* Attorney or Agent: Frank R. Trifari, et al., Ex. Gp.: 254

3,962,475, Re. S.N. 905,077, Filed May 11, 1978, Cl. 426/331, METHOD FOR PRESERVING HIGH MOISTURE CONTENT AGRICULTURAL GRAINS, Joseph G. Forest, et al., Owner of Record: *Inventor,* Attorney or Agent: Mark P. Levy, Ex. Gp.: 172

3,970,611, Re. S.N. 925,605, Filed Jul. 17, 1978, Cl. 526/65, MELT FINISHING PROCESS FOR POLYMERS PRODUCED BY VAPOR STATE POLYMERIZATION PROCESSES, James L. Jezl, et al., Owner of Record: *Standard Oil Company (Indiana), Chicago, Ill.,* Attorney or Agent: Arthur G. Gilkes, et al., Ex. Gp.: 144

3,971,768, Re. S.N. 925,602, Filed Jul. 17, 1978, Cl. 526/68, VAPOR PHASE REACTOR OFF-GAS RECYCLE SYSTEM FOR USE IN THE VAPOR STATE POLYMERIZATION OF MONOMERS, Edwin F. Peters, et al., Owner of Record: *Standard Oil Company (Indiana), Chicago, Ill.,* Attorney or Agent: Arthur G. Gilkes, et al., Ex. Gp.: 144

3,996,836, Re. S.N. 912,416, Filed Jun. 5, 1978, Cl. 86/20 C, APPARATUS FOR TRANSPORTING AND CHARGING UNCARTRIDGED EXPLOSIVES MORE PARTICULARLY PLASTIC EXPLOSIVES, Hubert Lichtenberg, Owner of Record: *Dynamit Nobel A.G., Troisdorf, Germany,* Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 223

4,003,736, Re. S.N. 903,298, Filed May 5, 1978, Cl. 75/3, METHOD FOR PREPARING DRY COLLECTED FUME FOR USE IN METALLURGICAL FURNACES, John W. Kreiger, et al., Owner of Record: *Bethlehem Steel Corporation, Bethlehem, Pa.,* Attorney or Agent: Joseph J. O'Keefe, et al., Ex. Gp.: 111

4,004,916, Re. S.N. 903,297, Filed May 5, 1978, Cl. 75/3, METHOD FOR AGGLOMERATING WET-COLLECTED FUME FOR USE IN METALLURGICAL FURNACES AND AGGLOMERATES PRODUCED THEREBY, John W. Kreiger, Owner of Record: *Bethlehem Steel Corporation, Bethlehem, Pa.,* Attorney or Agent: Joseph J. O'Keefe, et al., Ex. Gp.: 111

4,021,270, Re. S.N. 921,924, Filed Jul. 3, 1978, Cl. 148/1.5, DOUBLE MASTER MASK PROCESS FOR INTEGRATED CIRCUIT MANUFACTURE, Merrill Roe Hunt, et al., Owner of Record: *Motorola Inc., Chicago, Ill.,* Attorney or Agent: John A. Fisher, Ex. Gp.: 165

4,046,490, Re. S.N. 911,207, Filed May 31, 1978, Cl. 417/28, METHOD AND APPARATUS FOR ANTISURGE PROTECTION OF A DYNAMIC COMPRESSOR, Alexander Rutshtein, et al., Owner of Record: *Compressors Controls Corporation, Des Moines, Iowa,* Attorney or Agent: H. Robert Henderson, et al., Ex. Gp.: 343

4,050,893, Re. S.N. 922,654, Filed Jul. 7, 1978, Cl. 8/94.11, ARRANGEMENT FOR PREPARING NATURAL TISSUE FOR IMPLANTATION, Warren D. Hancock, et al., Owner of Record: *Hancock Laboratories Incorporated, Anaheim, Calif.,* Attorney or Agent: Richard F. Carr, Ex. Gp.: 141

4,077,901, Re. S.N. 907,080, Filed May 18, 1978, Cl. 223/252, ENCAPSULATION OF NUCLEAR WASTES, John L. Arnold, et al., Owner of Record: *Inventor,* Attorney or Agent: Richard G. Waterman, et al., Ex. Gp.: 223

PATENT NOTICES

Certificates of Correction for the Week of Sept. 12, 1978

Re.28,780	4,065,025	4,080,437	4,085,681
Re.29,591	4,066,561	4,080,722	4,085,683
D.246,335	4,068,103	4,080,814	4,085,695
D.247,017	4,070,225	4,080,940	4,085,757
3,976,476	4,070,311	4,081,135	4,085,865
4,018,437	4,070,938	4,081,687	4,086,004
4,031,690	4,073,004	4,081,719	4,086,131
4,035,835	4,073,309	4,081,977	4,086,371
4,037,216	4,073,430	4,082,429	4,086,640
4,040,379	4,073,855	4,082,497	4,086,641
4,041,435	4,074,276	4,082,598	4,087,045
4,041,658	4,075,003	4,082,955	4,087,161
4,042,497	4,075,593	4,083,037	4,087,204
4,045,588	4,076,606	4,083,512	4,087,229
4,047,099	4,078,195	4,083,748	4,087,231
4,049,154	4,078,212	4,083,934	4,087,237
4,050,891	4,078,451	4,084,243	4,087,311
4,057,075	4,078,492	4,084,327	4,087,630
4,060,611	4,078,991	4,084,463	4,088,034
4,060,630	4,079,280	4,084,629	4,088,120
4,061,745	4,079,702	4,085,030	
4,061,792	4,080,201	4,085,212	
4,064,802	4,080,337	4,085,284	

Dedication

3,815,015.—*William A. Swin* and *Flavian Reising, Jr.*, Fort Wayne, Ind. TRANSFORMER-DIODE ISOLATED CIRCUITS FOR HIGH VOLTAGE POWER SUPPLIES. Patent dated June 4, 1974. Dedication filed Oct. 17, 1977, by the assignee, *General Electric Company.*

Hereby dedicates to the Public the above-identified patent.

Disclaimers

Design No. 208,474.—*Gerald A. Curl*, Los Angeles County, Calif. MINIATURE LAMP. Patent dated Sept. 5, 1967. Disclaimer filed Sept. 29, 1977, by the assignee, *Chemetron Corporation.*

Hereby enters this disclaimer to the sole and complete claim of said patent.

3,607,866.—*Denis M. Bailey*, East Greenbush, N.Y. 3,4-DIHYDRO-1H-1,3,4-BENZOTRIA-ZEPINE-2,5-DIONES AND THEIR PREPARATION. Patent dated Sept. 21, 1971. Disclaimer filed July 17, 1978, by the assignee, *Sterling Drug Inc.*

Hereby enters this disclaimer to claims 1 through 22 of said patent.

3,678,421.—*Ichiro Ono*, Tokyo, Japan. PRESET DEVICE FOR ALL CHANNEL TUNER USING VARIABLE REACTANCE ELEMENT AS TUNING ELEMENT. Patent dated July 18, 1972. Disclaimer filed Mar. 27, 1978, by the assignee, *Alps Electric Co., Ltd.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,013,785.—*Leonard Weintraub*, Millburn, and *Allan H. Rosenberg*, Randolph, N.J. APAP TABLET CONTAINING FUMED SILICA AND PROCESS FOR MANUFACTURING SAME. Patent dated Mar. 22, 1977. Disclaimer filed Dec. 8, 1977, by the assignee, *Bristol-Myers Company.*

Hereby enters this disclaimer to claims 10 and 13 of said patent.

4,088,281.—*Albert R. Close*, Newhall, Calif. DUAL TENSION SINGLE SPRING RETRACTOR. Patent dated May 9, 1978. Disclaimer filed May 30, 1978, by the assignee, *American Safety Equipment Corporation.*

The term of this patent subsequent to May 31, 1994, has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 12, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-12-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-17-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-17-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-6-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-19-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-28-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-11-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-23-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	7-18-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	5-24-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-2-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-8-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-24-77

Expiration of patents: The patents within the range of numbers indicated below expire during August 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,994,087 to 2,998,605, inclusive
Plant Patents..... Numbers 2,085 to 2,094, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,757
REPLACEMENTS FOR BICONDYLAR JOINTS IN HUMAN LIMBS

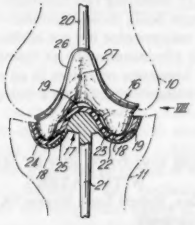
Arthur Jacob Helfet, 1917 Trust Bank Centre, Capetown, South Africa

Original No. 3,748,662, dated Jul. 31, 1973, Ser. No. 246,448, Apr. 21, 1972. Application for reissue Jul. 16, 1975, Ser. No. 596,375

Claims priority, application United Kingdom, Apr. 21, 1971, 10551/71

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.91 **16 Claims**



9. A replacement assembly for a bicondylar joint articulating two members of a human limb comprising two pairs of coacting male and female load-bearing mechanical condylar components, the male components consisting of one spherical or spheroidal protruberance and one arcuate ridge having a curvature in each of two planes at right angles, one of said planes being normal to the general axis of the limb when straight and the other being parallel to the said axis, one of the female components being provided with a spherical or spheroidal socket adapted to coact with the correspondingly shaped male component and the other of the female components being provided with one arcuate groove having a curvature in at least one of the said two planes, the curvature of the arcuate ridge and the arcuate groove in the plane normal to the general axis of the limb being an arc of a circle struck about the center of the sphere represented by the spherical or spheroidal components.

Re. 29,758
REINFORCED HEM FORMING DEVICE

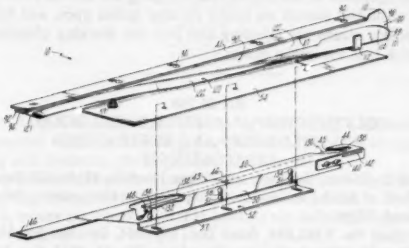
John L. Rockerath, and Harold J. Schreck, both of Utica, N.Y., assignors to Cluett, Peabody & Co., Inc., Troy, N.Y.

Original No. 3,906,877, dated Sep. 23, 1975, Ser. No. 515,492, Oct. 17, 1974. Application for reissue Sep. 21, 1977, Ser. No. 835,233

Int. Cl.[2] D05B *35/02*

U.S. Cl. 112—141 **12 Claims**

1. A reinforced hem forming device for use in a sewing machine installation for automatically forming a reinforced hem, along a lateral edge of a material blank as the blank is conveyed longitudinally forwardly through the forming device, having a front hem face, an elongated reinforcing ribbon underlying the front face, and an outer lateral inwardly folded edge section having a back hem face underlying the reinforcing ribbon and a tucked edge portion intermediate the front and back hem faces, the reinforced hem forming device comprising a longitudinally extending inner face member having an upper inner face for receiving a front hem face portion of a material blank as the material blank is conveyed longitudinally forwardly through the forming device and an outer longitudinally extending fold edge for folding an outer lateral edge section of the material blank inwardly therearound to underlie the front hem face portion of the material blank to form a back hem face portion, a longitudinally extending ribbon guide underlying the inner face member providing a longitudinally extending ribbon channel therebelow for conveying a reinforcing ribbon longitudinally forwardly beneath the front hem face portion of the material blank, and a folder extending longitudinally forwardly generally below the inner face member and ribbon guide and defining a material receiving guide trough for receiving the outer lateral edge section of the material blank, the folder having a double longitudinally extending twist with a first longitudinally extending twist section twisting forwardly in a clockwise direction to define a first longitudinally



extending guide trough section for folding the outer lateral edge section of the material blank inwardly around said fold edge of the inner face member and a second longitudinally extending twist section twisting in the clockwise direction to define a second longitudinally extending guide trough section for folding a tucked edge portion of the outer lateral edge section of the material blank to overly the back hem face portion of the material blank, the folder having a forward exit end adjacent the inner face member to provide that a hem formed on a material blank by the hem forming device exits from the forming device in a fully preformed condition with the reinforcing ribbon between the front and back hem faces thereof.

Re. 29,759
FUEL INJECTION TYPE ROTARY PISTON ENGINE

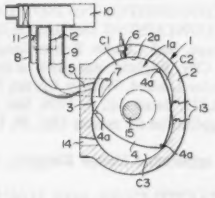
Kenichi Yamamoto, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Japan

Original No. 3,901,198, dated Aug. 26, 1975, Ser. No. 463,830, Apr. 24, 1974. Application for reissue Jun. 3, 1976, Ser. No. 692,384

Claims priority, application Japan, Apr. 30, 1973, 48/51262

Int. Cl.[2] F02B *53/10*

U.S. Cl. 123—205 **12 Claims**



1. A rotary piston type internal combustion engine comprising a casing including a rotor housing having a trochoidal

inner peripheral wall and a pair of side housings secured to the opposite sides of said rotor housing to define a rotor chamber therein, a substantially polygonal rotor rotatably mounted in said rotor chamber and having apices slidingly contacting the trochoidal inner peripheral wall of the rotor housing so as to define working chambers between the casing and the rotor, means for rotating the rotor so as to effect volumetic changes of each working chamber through intake, compression, combustion and exhaust strokes, first air intake port means formed in at least one of said side housings so as to open into the working chamber which is in the intake stroke, first air intake passage means communicating with said first air intake port means and having first throttle valve means positioned therein, second air intake port means formed in said rotor housing so as to open into the working chamber which is in the intake stroke, second air intake passage means communicating with said second air intake port means and having second throttle valve means positioned therein, means for closing said first throttle valve means in said first air intake passage means during light load operation of the engine while keeping the second throttle valve of said second air intake passage means open, and fuel injection means for injecting fuel into the working chamber which is in the intake stroke.

Re. 29,760
POLYFUNCTIONAL ALKOXY ENDBLOCKED POLYSILOXANES AND THEIR CURED COMPOSITIONS

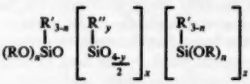
Paul L. Brown, Saginaw, and James Franklin Hyde, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Original No. 3,161,614, dated Dec. 15, 1964, Ser. No. 145,455, Oct. 16, 1961. Application for reissue Sep. 13, 1977, Ser. No. 832,842

Int. Cl.² C08G *77/04*

U.S. Cl. 528—41 **2 Claims**

1. A composition of matter consisting essentially of a siloxane of the formula



in which R is selected from the group consisting of monovalent haloaliphatic hydrocarbon radicals having no halogen on the carbon alpha to the oxygen and monovalent aliphatic hydrocarbon radicals both of said radicals having from 1 to 8 inclusive carbon atoms, both R′ and R″ are each selected from the group consisting of monovalent hydrocarbon radicals, monovalent halohydrocarbon radicals and monovalent cyanoalkyl radicals all of from 1 to 18 carbon atoms, n has an average value from 2 to 3 inclusive, y has an average value from 1.99 to 2 inclusive, z has an average value from 1 to 1.01 inclusive and the sum of y+z is 3 and x has a value of at least 7.

Re. 29,761
GUANIDINO, THIOUREIDO AND ISOTHIOUREIDO DERIVATIVES CONTAINING IMIDAZOLE GROUPS

Graham John Durant, and Charon Robin Ganellin, both of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

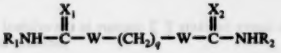
Original No. 3,968,227, dated Jul. 6, 1976, Ser. No. 542,971, Jan. 22, 1975. Application for reissue Oct. 19, 1977, Ser. No. 843,399

Claims priority, application United Kingdom, Feb. 7, 1974, 5596/74

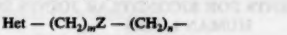
Int. Cl.² C07D *233/64;* A61K *31/415*

U.S. Cl. 424—273 R **19 Claims**

1. A compound of the formula:



wherein R_1 and R_2, which may be the same or different, each represent a grouping of the structure:



wherein Het is imidazole which is attached at a ring carbon and which is optionally substituted by lower alkyl or halogen; Z is sulphur or a methylene group; m is 0, 1 or 2; n is 2 or 3 and the sum of m and n is 3 [,] *or* 4 [or when the adjoining X_1 or X_2 is sulphur, 2]; X_1 and X_2, which may be the same or different, are each sulphur or NY wherein Y is hydrogen or lower alkyl; W is NH, and when X_1 and X_2 are NH, W may also be sulphur; and q is an integer from 2 to 8; or a pharmaceutically acceptable acid addition salt thereof.

17. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering to an animal in need of inhibition of said H-2 histamine receptors in an effective amount to inhibit said H-2 histamine receptors a compound of claim 1.

Re. 29,762
PROCESS FOR WELDING SHEET METAL COATED WITH LAYERS

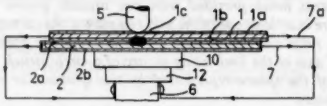
Otto Alfred Becker, Robert Koch Strasse 59, 66 Saarbruecken 6, Fed. Rep. of Germany

Original No. 3,798,407, dated Mar. 19, 1974, Ser. No. 181,149, Sep. 16, 1971. Continuation-in-part of Ser. No. 823,077, May 8, 1969, Pat. No. 3,614,375. Application for reissue Oct. 17, 1977, Ser. No. 843,114

Claims priority, application Fed. Rep. of Germany, May 8, 1968, 1765366; May 28, 1968, 1765489; Aug. 19, 1968, 1765970; Sep. 3, 1968, 1790058; Sep. 17, 1968, 1790142; Jan. 17, 1969, 1902569

Int. Cl.² B23K *9/28*

U.S. Cl. 219—92 **11 Claims**



1. In a process of connecting, by the electrical fusion of a metal, sheet metal panels and the like articles coated on at least one surface with a layer of material differing from the sheet metal, at least one of said layers being an outer layer on superposing said sheet metal panels the improvement which consists in

a. conducting the welding current from one pole of a current source directly by means of a first contact device attached to a surface area on one of said superposed metal panels, said surface area being stripped of said coating, into and through said first sheet metal panel essentially parallel to its surface to and through the predetermined welding area of said first sheet metal panel and

b. causing the welding current to pass from said welding area to and through the predetermined welding area of the second superposed sheet metal panel through said second sheet metal panel essentially parallel to its surface and through a second contact device attached to said second sheet metal panel to the other pole of the current source,

c. thereby effecting welding connection of the two sheet metal panels with each other without substantially affecting at least one of the outer layers of said coated sheet metal panels.

Re. 29,763

CRYSTAL VIBRATOR MOUNTING

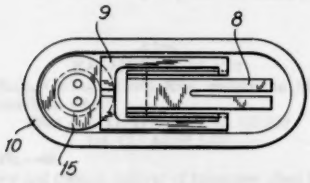
Masanori Kawai, Nagano, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Original No. 3,909,640, dated Sep. 30, 1975, Ser. No. 454,888, Mar. 26, 1974. Application for reissue Oct. 20, 1976, Ser. No. 734,054

Claims priority, application Japan, Mar. 27, 1973, 48-34107

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—344 14 Claims



10. A hermetically sealed quartz crystal vibrator assembly particularly suitable for use as a time standard in an oscillator circuit comprising in combination a flexural mode tuning fork quartz crystal vibrator having first and second substantially opposed planar surfaces and being adapted to vibrate in the first vibratory direction substantially parallel to said surfaces, and a pair of mounting plates, each mounting plate having a first portion secured to said first opposed surfaces of said vibrator at a non-vibratory portion of said tuning fork vibrator, each said mounting plate including a second portion mounted to a reference member, each said mounting plate having a first elongated resilient portion and a second elongated resilient portion intermediate said first and second portions, said first resilient portion being adapted to vibrate at an angle of about 90° with respect to said first vibratory direction and said second resilient portion being adapted to vibrate in a direction parallel to said first vibratory direction.

Re. 29,764

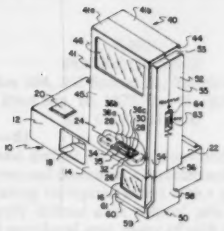
ELECTRONIC FLASH UNIT HAVING AN ADJUSTABLE MOUNTING MECHANISM AND MOVABLE ELECTRICAL PLUG

Jeffrey R. Stoneham, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,997,775, dated Dec. 14, 1976, Ser. No. 566,633, Apr. 8, 1975. Application for reissue Mar. 9, 1977, Ser. No. 776,022

Int. Cl.[2] G03B *15/02*

U.S. Cl. 354—145 10 Claims



1. In an electronic flash unit having a housing, a flashtube mounted within said housing, and electrical means for energizing said flashtube, the improvement comprising:

a. electrical contacts adapted to be electrically connected to the output terminals of a flash-firing mechanism;

b. means associated with said housing for defining an operational path;

c. means electrically connecting said electrical contacts to said electrical means; and

d. means mounting said electrical contacts for moving said contacts along said path while said contacts remain electrically connected to said electrical means to position said contacts over a continuous range of flashfiring locations relative to said flashtube.

PLANT PATENTS

GRANTED SEPTEMBER 12, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,298
KALANCHOE PLANT

Claude Hope, Carbago, Costa Rica, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Aug. 11, 1977, Ser. No. 823,853
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of kalanchoe plant known by the cultivar name Largo and characterized particularly as to uniqueness by the combined characteristics of red purple flower color; excellent placement of flowers and superior keeping qualities; the large mound-type floral display; small compact foliage; profuse self-branching; excellent rooting qualities, and by the characteristic of being ideally suited for either normal or miniature flowering.

4,299
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Grantsville, W. Va., and William E. Duffett, Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Sep. 14, 1977, Ser. No. 833,376
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the cultivar name Superstar and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; daisy capitulum type; white ray floret color; diameter across face of capitulum ranging from 100 to 120 mm. at maturity; uniform seven week photoperiodic flowering response to short days; tall plant height when grown as a single stem cut spray; and semi-upright branching pattern.

4,300
DOGWOOD TREE

Mel Wills, Box 484, 365 Second St., Fairview, Oreg. 97024

Filed Sep. 16, 1977, Ser. No. 834,154
Int. Cl. A01H *5/00*
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of dogwood tree substantially as herein shown and described, characterized particularly as to novelty by having variegated leaves with a generally centrally oriented sharply defined dark colored area surrounded by a light colored peripheral area, many of such leaves also having sharply defined patches of intermediate coloration.

4,301
ROSE PLANT

David L. Armstrong, Orange, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Oct. 17, 1977, Ser. No. 843,139
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—15 1 Claim

1. A new and distinct variety of hybrid tea rose, substantially as described and illustrated herein, said plant being characterized by a very vigorous upright-spreading to semi-climbing habit, which grows tall and bushy and has foliage of a medium olive-green color with leaflets tending to be somewhat folded inward bilaterally from the midrib, yet hanging downward from the rachis, the flowering of said plant being characterized in that its sepals turn down quickly as the bud begins to open, the blooms have double petalage of from about 25 to 34 petals with two to four petaloids; and the bloom spreads from 5 to 5½ inches, producing an overall color effect at first of a medium golden yellow, without significant other coloration, which lightens in shade as the bloom matures.

PATENTS

GRANTED SEP. 12, 1978

ERRATA

For CLASS	See PATENT NO.
405–063	4,112,689
405–057	4,112,690
405–119	4,112,691
405–271	4,112,692
405–132	4,112,693
405–150	4,112,694
405–163	4,112,695
405–145	4,112,696
405–209	4,112,697
405–167	4,112,698
060–641	4,112,745
074–217 R	4,112,767
070–363	4,112,820
134–141	4,112,937
400–333	4,113,081
339–091 R	4,113,179
151–054	4,113,227
366–056	4,113,238
277–001	4,113,242
272–069	4,113,246
356–155	4,113,393
422–191	4,113,435
422–065	4,113,436
422–193	4,113,438
422–177	4,113,439
422–132	4,113,440
422–197	4,113,441
428–220	4,113,537
209–609	4,113,609
209–705	4,113,610
521–029	4,113,666
521–163	4,113,667
521–060	4,113,668
521–108	4,113,669
521–095	4,113,670
521–108	4,113,671
521–060	4,113,672
528–271	4,113,693
528–094	4,113,697
528–481	4,113,698
528–126	4,113,699
528–138	4,113,700
528–075	4,113,702
528–299	4,113,703
528–289	4,113,704
528–289	4,113,706

ERRATA—Continued

528–279	4,113,707
528–313	4,113,708
424–078	4,113,709
526–030	4,113,710
544–408	4,113,724
544–296	4,113,725
544–380	4,113,726
544–362	4,113,727
562–503	4,113,766
562–577	4,113,767
562–535	4,113,768
562–534	4,113,769
562–532	4,113,770
562–568	4,113,771
562–583	4,113,772
029–630 B	4,114,008
235–096	4,114,025
235–375	4,114,026
235–419	4,114,027
235–458	4,114,028
235–449	4,114,029
235–464	4,114,030
235–474	4,114,031
235–493	4,114,032
235–494	4,114,033
313–188	4,114,064

PATENTS

GRANTED SEPTEMBER 12, 1978

GENERAL AND MECHANICAL

4,112,521

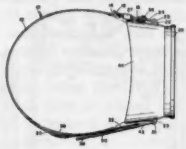
QUICK ADJUST STRAP FOR DIVER'S FACE MASK

Alan K. Uke, 2306 Ocean Front, Del Mar, Calif. 92014

Continuation of Ser. No. 542,724, Jan. 21, 1975, abandoned. This application Mar. 3, 1977, Ser. No. 774,127

Int. Cl.[2] A61F *9/02*

U.S. Cl. 2—452 **6 Claims**



1. A quick adjust strap for a diver's face mask equipped with brackets and attachment rings on each side of the mask for the connection of the strap thereto, said strap comprising,

a flexible resilient headband to enclose a diver's head and provided with slots in one end,

a flexible ribbon attached to one end of said headband for being threaded through the face mask attachment rings and doubling back upon itself,

said ribbon having a tacky material on a face thereof.

said ribbon being foldable back upon itself with the tacky material maintaining the fold and permitting fold separation only by application of an outward pulling force on said ribbon fold,

a resilient tab formed on one free end of said ribbon that is grippable for adjustment of the strap, said tab being larger than the opening in the associated attachment ring such that it must be forced through the attachment ring when threading said ribbon through the attachment ring,

said ribbon being superimposed over a part of said tab and permanently fixed thereto in the overlapping area of said ribbon and said tab,

said tab having a first end extending between the end portions of said tacky material and said ribbon, said tab forming a backing for said tacky material for allowing greater force to be applied when making the connection to the tacky material on said ribbon surface,

said tab having an integral second end with a thickness and width substantially larger than the thickness and width of said ribbon,

said tacky material only covering the first end portion of said tab leaving the enlarged second end free from connection to said tacky material and being spaced therefrom for making said second end readily locatable and grippable.

4,112,522

KNEE-JOINT PROSTHESIS

Aram Dadurian, Knochenhauer Strasse 15, D 2800 Bremen, and Günther Rehder, Mummelmannstrasse 10, D 2805 Stuhr 3, both of Germany

Filed Nov. 4, 1976, Ser. No. 738,978

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1975, 2549318

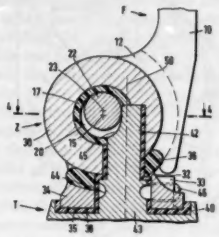
Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.91 **10 Claims**

1. A joint prosthesis having a flexing-axis pin having a flexing axis, first and second parts which are adapted to be anchored in first and second bones, respectively, on opposite sides of said joint and which are pivotable through a range of flexing angle relative to one another about said flexing-axis pin, said joint prosthesis further comprising:

a pivot disposed on one of said first and second parts and extending along the longitudinal axis of that part on which it is disposed; and

an intermediate element having a pin receiving bore for receiving said flexing-axis pin, a pivot-receiving bore for



receiving said pivot and a securing element for securing said pivot in said pivot-receiving bore, the central portion of said flexing-axis pin together with said pivot forming an abduction and rotation abutment in which the amount of permissible of rotation is dependent on the flexing angle.

4,112,523

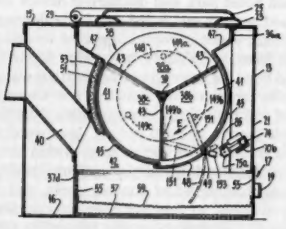
SANITARY DISPOSAL UNIT

Geoffrey N. Williams, 12 Rembrandt Dr., Mulgrave, Australia (3170)

Filed Mar. 9, 1976, Ser. No. 665,441

Int. Cl.[2] A47K *11/02*

U.S. Cl. 4—111.3 **8 Claims**



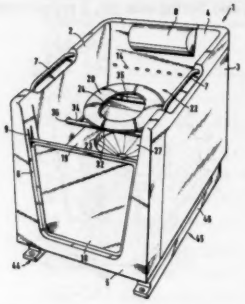
1. A sanitary disposal unit including: a rotatable waste receptacle means having at least one waste receiving compartment; a combustion chamber disposed below said receptacle means; heating means located within said combustion chamber; and upwardly facing arcuate sealing means located closely adjacent said receptacle means and between said combustion chamber and said receptacle means, said sealing means including an opening having a door; said rotatable waste receptacle means being locatable in a first position in which said waste-receiving compartment may be loaded from above, whereafter said receptacle means is rotatable to a second position thereby allowing said waste to fall downwardly from said compartment through said opening and into said combustion chamber wherein said heating means causes combustion of said wastes; said sealing means inhibiting communication of heat and odour from said combustion chamber to said receptacle means; said door opening means being responsive to the rotation of said receptacle means from said first to said second positions to open said door to thereby enable said waste to fall through said opening.

4,112,524

SHOWER-BATH TUB

Hans A. Johansson, Treharadsvägen 36, Eslöv, Sweden

Filed Jul. 12, 1976, Ser. No. 704,376
Int. Cl.[2] A47K 3/22
U.S. Cl. 4—148 **7 Claims**



1. A shower-bath tub adapted to rest on a supporting surface, and having at least one shower water emitting device for washing a person sitting on a seat disposed within the tub, the shower-bath tub comprising a bottom portion provided with a shower-water discharge and an upright portion disposed adjacent said bottom portion, the improvement consisting in that: a holed part of said upright portion forms the bottom of an area within the tub adapted to have said seat disposed therein during washing, said holed part being spaced substantially beneath said seat when said seat is disposed in said area with the hole in said holed part aligned beneath a hole provided in said seat, and in that a space is provided beneath said upright portion and has a discharge device housed therein for collecting and flushing away feces passing down through said aligned holes in said seat and in said holed part, said discharged device comprising a bowl disposed beneath said holed part for collecting feces, at least one flushing water conduit connected to said bowl for flushing away feces, and a discharge conduit connected to the bottom of said bowl for conveying feces into a sewage disposal system, said discharge conduit including a drain-trap portion, and said holed part including a rim depending from the periphery of the hole therein so as to project downwardly into the upper portion of said bowl and to form within the latter an inner wall of an annular downwardly opening flushing channel into which said flushing water conduit opens, said discharge device being disposed so that the drain-trap portion of said discharge conduit is spaced above said supporting surface, and there being a compartment formed between the bottom of said shower-bath tub and said supporting surface, said compartment being open toward three sides of the tub, and said tub further including: a wheel-chair having a low undercarriage receivable with said compartment beneath the tub, said undercarriage carrying column means being arranged to extend vertically of said tub; carrier arm means on the upper end of said column means; and a seat carried by said carrier arm means, and positionable within said tub.

4,112,525

DRYING RACK ASSEMBLY FOR BATHING COMPARTMENTS

Jack C. Roberts, 413 Virginia Dr., Orlando, Fla. 32803

Filed Aug. 25, 1977, Ser. No. 827,477
Int. Cl.[2] A47K 3/14
U.S. Cl. 4—154 **10 Claims**

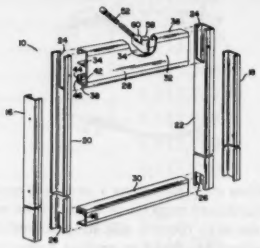
1. A closure for a bathing compartment such as a shower, bathtub or the like, comprising:

an extrusion adapted to be rigidly positioned between opposing closure walls of said bathing compartment, said extrusion including a lengthwise partition dividing said extrusion into two separate and contiguous portions;

a foldable closure member suspended from a first one of said portions of said extrusion and adapted to be drawn between said closure walls;

a drying arm coupled at one end in the second portion of said extrusion; and

pivoting and sliding means in said second portion of said extrusion and coupled with said one end of said drying arm for permitting said arm to slide along said extrusion



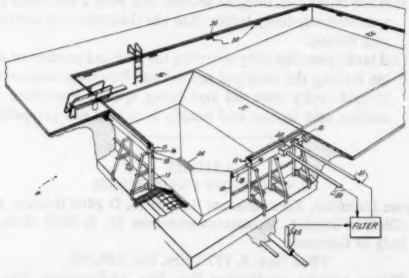
and be folded within said second portion; and further comprising low friction bearing means carried by said extrusion in said lower portion, said bearing means coupled to said closure member whereby said bearing means and said closure member may be moved back and forth across said extrusion; and further comprising a second extrusion spaced below said one extrusion and a second low friction bearing means carried by said second extrusion and coupled to the lower edge of said closure member.

4,112,526

WATER LEVEL CONTROLLER FOR SWIMMING POOL GUTTER

James A. Patterson, 2375 Valleyview Dr., Columbus, Ohio 43204

Continuation of Ser. No. 653,512, Jan. 29, 1976, abandoned, which is a division of Ser. No. 592,950, Jul. 3, 1975. This application Feb. 28, 1977, Ser. No. 772,732
Int. Cl.[2] E04H 3/20
U.S. Cl. 4—172.17 **2 Claims**



1. In a swimming pool having generally vertical walls and a filter system adjacent said pool, a nonflooding perimeter gutter system for returning water from said pool to said filter system comprising,

an open upper gutter section located adjacent the top of said vertical walls and extending around the perimeter of said pool and having an inner wall, a back wall and a bottom wall, said upper gutter section being operative to accommodate sudden water surges over said inner wall,

a closed lower gutter section forming conduit around the

perimeter of the pool adjacent said upper gutter section, said lower gutter section, at all times during operation, beingcompletely filled with water,

means connecting said lower gutter section to said upper gutter section at a plurality of locations spaced around the perimeter of said pool, said connecting means providing passageways for the flow of water from said upper section to said lower section,

a plurality of skimmer openings spaced around the perimeter of said pool and located in said inner gutter wall adjacent the top of said inner gutter wall,

means independently and automatically closing each said opening, said closing means including a float located in said gutter and associated with each said opening, said float being located well below said skimmer openings but above said lower gutter section, and effecting the closing of said openings when the level of water in said gutter, lifting said float, rises to a level well below said opening and well above the level of said passageways in said second gutter section,

said skimmer openings and said closing means continuously supplying water from said pool to said upper gutter section at locations spaced around the perimeter of said pool to maintain a constant flow of water to said lower gutter section above said passageways during both periods of quiescence and periods of greater pool activity, and

suction means connected to said lower gutter section for positively withdrawing water therefrom and directing it to said filter system,

thereby continuously withdrawing water simultaneously from all portions of said perimeter gutter through said plural passageways in order to maintain a constant flow of water in said gutters with a constant removal of water from said gutters, without relying on gravity flow to said filter system, thereby creating substantially uniform surge capacity around the perimeter of said pool,

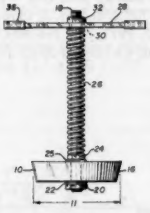
the maintenance of water in said upper section preventing air from flowing into said lower section and into said pump.

4,112,527

TEMPORARY STOPPER FOR OUTLETS OF TOILET BOWLS

Lauro B. Giubilo, 194 Smallwood Ave., Belleville, N.J. 07109

Filed Aug. 11, 1977, Ser. No. 823,873
Int. Cl.[2] A47K *1/14*
U.S. Cl. 4—295 **9 Claims**



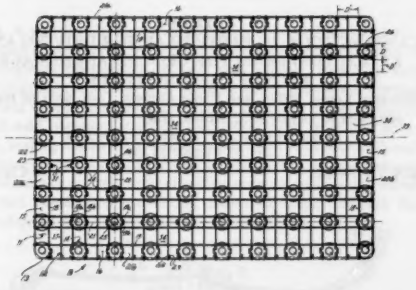
1. A temporary stopper for closing an outlet of a toilet bowl of conventional construction and having a generally oval top and a lip around a substantial portion thereof, the installed stopper preventing unwanted back flow of fluid and the like from a connected sewer, said stopper including: (a) a substantially rigid rod of selected length; (b) a disc member of at least partially resilient material, said disc having a diametrical extent at least slightly larger than the outlet of said bowl, this disc mounted on one end of the rod; (c) means for retaining said disc at the end of the rod and also for retaining this disc so that at its mounting position on the rod and in back flow stopping condition in the bowl the disc is sealed at the rod to inhibit any fluid flow thereby; (d) a handle having a hole at a midportion thereof, this hole sized to provide at least a sliding fit on the rod, the handle of a length less than the long extent of the opening at the top of the bowl and greater than the opening at the shorter transverse opening of the bowl, said handle being a channel member and having end members which members are slidable in this channel to a selected extended condition and means is provided by securing these ends in the selected position, said means including a bolt and nut and a slot slidably accommodating the shank of the bolt, and a through hole sized for the turning therein of the shank of the bolt, the slot formed in one component and the hole in the other component, the midportion of the handle forming one component and an end member providing the other component; (e) a compression spring slidable and carried on and by the rod, this spring disposed between the handle and the means for retaining the disc, the spring bias urging the handle away from the disc, and (f) means for limiting the outward travel of the handle on the rod when a temporary closing of the outlet of the toilet bowl against back flow is achieved by positioning the disc member over the outlet of the bowl and pressing this disc into flow inhibiting condition by moving the handle downwardly on the rod to compress the spring and at this downward position the handle is maneuvered and turned to bring both ends of the handle under a lip portion of the toilet bowl whereat the handle is released with the ends engaged by the lip as and with the spring bias urging and maintaning the disc in a flow sealing condition.

4,112,528

BOX SPRING ASSEMBLY AND SMALL DIAMETER SINGLE CONE COIL SPRING FOR USE IN THAT ASSEMBLY

Larry Higgins, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Continuation-in-part of Ser. No. 726,811, Sep. 27, 1976, abandoned. This application Apr. 4, 1977, Ser. No. 784,439
Int. Cl.[2] D47C *23/04*
U.S. Cl. 5—248 **5 Claims**



1. An improved box spring assembly comprising

a plurality of conical coil springs oriented in a plurality of parallel columns and a plurality of parallel rows, each of the coil springs being of a regular single cone frustoconical configuration, each of the coil springs having the same diameter as all other coil springs, and each of the coil springs having a top loop diameter no greater than three and one-half inches so that said coils exhibit a substantially straight line deflection curve over a major portion of their possible range of deflection,

the coil springs of each of said columns being spaced from the adjacent coil springs in the adjacent column a distance at least as great as the diameter of the coil springs, and the coil springs of each of said rows being spaced from the adjacent coil springs in the adjacent row a distance at least as great as the diameter of the coil springs, and

a welded wire grid having at least one longitudinal wire provided for each column of coil springs and at least one

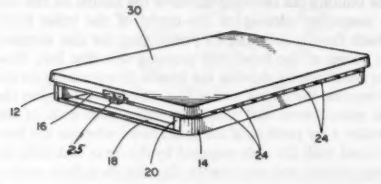
transverse wire provided for each row of coil springs, said transverse and longitudinal wires being welded one to the other, and at least one of said transverse and longitudinal wires being connected to each of said coil springs.

4,112,529

FOUNDATION UNIT FOR BEDDING

Gerald A. Golembeck, Lake Elmo, and Thomas L. Horwitz, St. Paul, both of Minn., assignors to The United States Bedding Company, St. Paul, Minn.

Filed Jun. 20, 1977, Ser. No. 807,968
Int. Cl.² A47C *23/00*
U.S. Cl. 5—354 **5 Claims**



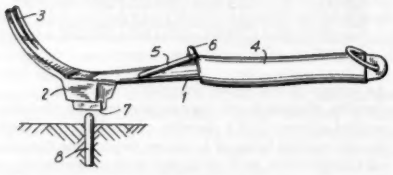
1. A foam foundation unit for bedding comprising a base frame member formed of a pair of longitudinal side frame members and a pair of transverse end frame members joined one to the other to provide a base frame of rectangular shape, a plurality of longitudinally spaced apart slats extending crosswise between the longitudinal side frame members, a grid of spaced crosswise and lengthwise extending metal members, and means fixedly securing the grid directly to the slats and the base frame members at points where the grid crosses over the slats at base frame members, and a foam layer supported on the top side of the grid.

4,112,530

CAMPING TOOL, IN PARTICULAR FOR DRIVING AND EXTRACTING FROM THE GROUND ANCHORAGE PEGS OF CAMPING TENTS

Giovanni Lecce, Milan, and Paolo Andena, Lodi, both of Italy, assignors to Leyan S.r.l., Milan, Italy

Filed Mar. 22, 1977, Ser. No. 780,066
Int. Cl.² B66F *15/00*
U.S. Cl. 7—146 **3 Claims**



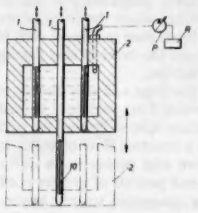
1. A camping tool, particularly for driving and extracting pegs for anchoring of tents on the ground, comprising: an elongated metallic body with a longitudinal axis; a curved portion at one end of said body and curved with respect to the longitudinal axis of said body; said curved body having a V-shaped gap with straight-lined edges forming the V-shaped, a mass portion at said one end of said body and located where said curved portion joins said elongated body for driving said pegs; a handle at the other end of said body for using and operating the tool; a ring-shaped member pivoted on said elongated metallic body for connecting hookingly with a peg for extracting the peg from the ground; and a projecting portion on said ring-shaped member for extending into a hole in a peg for extracting the peg from the ground.

4,112,531

METHOD OF PRINTING WEBS

Mathias Mitter, Falkenstr. 57, 4815 Schloss Holte, Fed. Rep. of Germany

Division of Ser. No. 735,198, Oct. 26, 1976. This application Apr. 15, 1977, Ser. No. 788,003
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2608005
Int. Cl.² D06B *1/08*
U.S. Cl. 8—149 **6 Claims**



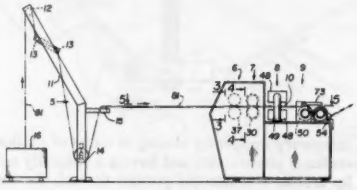
1. A method of printing webs, particularly textile webs, comprising the steps of
providing a plurality of individual dot-printing elements each having a free end;
supporting a web to be printed in a path in which a surface of the web faces the free ends of the printing elements;
supplying printing medium to the printing elements for entrainment by the same;
moving respective ones of the printing elements until the free ends thereof contact at least the surface of the web to yield up the entrained printing medium to the web; and
retracting the printing elements subsequently to such contact.

4,112,532

METHOD OF PADDING AND EXTRACTING A CONTINUOUSLY ADVANCING CIRCULAR KNIT FABRIC TUBE

Frank Catallo, 84 Wheatley Rd., Old Westbury, N.Y. 11568

Division of Ser. No. 739,258, Nov. 5, 1976. This application May 31, 1977, Ser. No. 801,550
Int. Cl.² D06B *3/10, 15/02*
U.S. Cl. 8—151 **2 Claims**



1. In a method of padding and extracting a continuously advancing circular knit fabric tube having upper and lower layers by passage through a puddle of impregnating liquid contained within an upwardly open nip defined by a pair of opposed horizontally disposed squeeze rolls, the steps of spreading the advancing fabric tube to a predetermined width, then immediately directing said spread fabric tube onto one of said squeeze rolls for advance in a generally downward direction through said puddle into said nip, the said upper layer of said fabric tube being free from contact with either of said

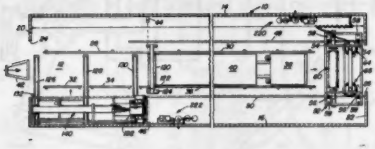
squeeze rolls until its passage through said nip, and expelling any entrapped air in said fabric tube through the said upper layer thereof during its advance over the said one of said squeeze rolls toward engagement with said nip as the result of directing said fabric tube into said puddle of impregnating liquid under controlled tension.

4,112,533

INTERIOR-EXTERIOR TRUCK BODY WASH

Douglas R. Brager, 707 6th St., East Missoula, Mont. 59801

Filed Oct. 7, 1976, Ser. No. 730,642
Int. Cl.² B60S *3/06*
U.S. Cl. 15—53 A **16 Claims**



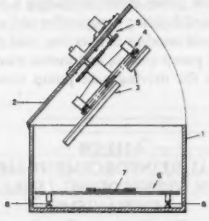
1. An apparatus for washing a trailer body of the type including a rear opening therein, said apparatus including an elongated extendable boom structure having base and free ends, support means supporting said boom structure from said base end in generally horizontal position and for generally horizontal lateral shifting, a washing head assembly carried by said free end, and means operative to selectively extend and retract said free end of said boom wherein said free end of said boom includes support wheel means for rollingly supporting said free end from and for movement along the inside floor of a trailer into which said free end is extended, said support means including a carriage from which said base end is supported, a support surface, means guidingly supporting said carriage from said surface for back and forth movement relative thereto in a horizontal path extending transversely of said boom, and said carriage including a horizontal surface upon which said wheel means is supported when said boom is retracted and a bridge structure positionable to bridge a narrow gap between said horizontal surface and the floor of a trailer behind which said carriage is registered.

4,112,534

WASHER FOR NYLOPRINT PRINTING BLOCKS OR THE LIKE

Oyvind Hovengen, 3370 Vikersund, Norway

Filed Feb. 25, 1977, Ser. No. 771,995
Claims priority, application Norway, Feb. 27, 1976, 760662
Int. Cl.² A46B *13/02*
U.S. Cl. 15—77 **8 Claims**



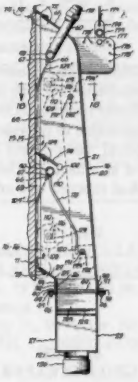
1. An apparatus for the washing out of printing blocks of the "Nyloprint" type or the like, comprising a brush device coupled to a driving means and adapted to be moved across a printing block which, during the washing is fixedly disposed in a container with a cleaning bath in which the printing block and the brush device is immersed, wherein the brush device comprises at least two brush units which are rotatably mounted about respective substantially parallel rotational axes, and which by means of a motion mechanism are adapted to move along a circular path during simultaneous rotation about their rotational axes, and wherein each of said brush units has a larger radial size than the distance between its rotational axis and the center of said circular path, and such a shape and orientation in relation to the other brush unit that individual rotation of the units during their movement in said circular path takes place without mutual interference.

4,112,535

HIGH PRESSURE JET WALL CLEANER APPARATUS

Robert W. Wild, South Wales, and Joseph G. Keeney, Tonawanda, both of N.Y., assignors to C. H. Heist Corporation, Clearwater, Fla.

Filed Jun. 21, 1976, Ser. No. 697,964
Int. Cl.² A47L *11/38*
U.S. Cl. 15—98 **30 Claims**



1. A unit for cleaning a substantially even wall surface comprising a housing, an opening in said housing for placement in contiguous relationship to said wall surface, means in said housing for projecting high pressure water against the portion of said wall framed by said opening, means in communication with said housing for conducting water away from said housing, sealing means for physical engagement with said wall, and affixing means for affixing said sealing means on said housing substantially entirely around said opening to confine said water in said housing by preventing escape of water between the junction of said sealing means with said wall.

4,112,536

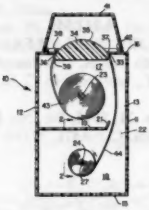
APPLICATOR

John C. Carson, Jr., Manasquan Park; Clarence R. Robbins, Piscataway, and Divaker B. Kenkare, South Plainfield, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 647,932, Jan. 9, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,348
Int. Cl.² B05C *17/00*
U.S. Cl. 15—104.94 **5 Claims**

1. Disposable apparatus for dispensing a fluent composition for personal body use comprising a casing having a top wall opening, a stationary web backing member extending across said casing with a sector thereof projecting through said opening, said sector having a smooth firm cylindrical surface extending externally of said casing about an axis within the casing, means in said casing below said member rotatably mounting a supply roll of a pre-treated carrier web bearing said composition, said supply roll being rotatable on an axis substantially coincident with the axis of said cylindrical surface

and said web passing directly from said supply roll out through said opening at one side of said member to closely overlie said cylindrical surface of said member and present a firmly backed stationary applicator area outside said casing and then passing into said casing along the other side of said member, and web rewind means rotatably mounted in said casing below said supply roll located to directly receive said web and operable for displacing said web to selectively dispose a fresh area of



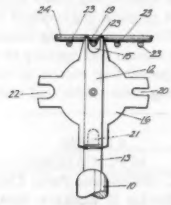
web in overlying relation to said member, said web rewind means comprising a spindle having web attachment means and mounted for unidirectional rotation such that the web may be displaced only in the direction to provide a fresh exposed area overlying said cylindrical surface, and said casing being so constructed as to serve as a handle to be grasped by the user while rubbing the backed exposed web area over the part to be treated.

4,112,537

GRILL SCRAPER

Roger W. Heuck, Cincinnati, Ohio, assignor to M. E. Heuck Company, Cincinnati, Ohio

Filed Dec. 23, 1977, Ser. No. 863,947
Int. Cl.[2] A47J *37/07*; A47L *17/00*; B25F *1/04*
U.S. Cl. 15—105 **4 Claims**



1. A tool for scraping the rods or wires constituting a grill, comprising

(a) a handle member,

(b) a support fixed to the distal end of said handle member,

(c) a scraper wheel having a plurality of rod scraping extensions having notches of different widths and depths on its periphery, and rotatably secured to said support,

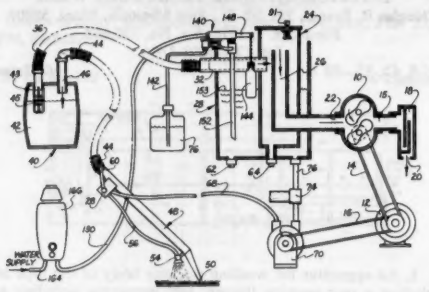
(d) said support having at its distal end a U-shaped notch of a width substantially the same size as but at least equal to the width of the widest scraping notch on said wheel and of a depth at least equal to the deepest scraping notch, whereby the notch of any of said scraping extensions may be aligned with said U-shaped notch to hold said wheel against rotation during a scraping operation.

4,112,538

CARPET CLEANING MACHINE

Jack A. Bates, 2530 Fishinger, Columbus, Ohio 43221

Continuation-in-part of Ser. No. 471,508, May 20, 1974, Pat. No. 3,942,217, which is a continuation of Ser. No. 260,586, Jun. 7, 1972, abandoned. This application Mar. 9, 1976, Ser. No. 665,268
Int. Cl.[2] A47L *7/00*
U.S. Cl. 15—321 **8 Claims**



1. A carpet cleaning machine comprising, in combination, wheeled frame means; a dirty fluid collecting means on the upper portion of said frame means and including a collecting means inlet and outlet; blower means mounted on said frame means and including a blower inlet communicating with said outlet of said dirty fluid collecting means and a blower outlet communicating with the enviroment; a manually manipulatable carpet cleaning tool including a tool outlet for dispensing cleaning fluid and a tool inlet for collecting dirty fluid from the carpet; passage means for delivering said dirty fluid from said tool inlet to said collecting means; means forming a source of hot water; a cleaning fluid reservoir for holding a supply of cleaning fluid; holding tank means for holding a solution of cleaning fluid and hot water mounted on said frame means and including a holding tank inlet and a holding tank outlet; first conduit means connecting said holding tank means inlet with said source of hot water for delivering a flow of hot water to said holding tank means inlet; second conduit means for delivering cleaning fluid from said reservoir to said holding tank means inlet; valve means interposed in both said first and second conduit means for simultaneously controlling a flow of cleaning fluid and a flow of hot water to said holding tank inlet to thereby form said solution in said holding tank means; and automatic valve actuator for opening said valve means upon attainment of a predetermined lower level of solution in said holding tank means, and for closing said valve means upon attainment of a predetermined upper level of solution in said holding tank means; pump means including a pump inlet communicating with said holding tank outlet and a pump outlet; a flexible cleaing fluid conduit connecting said tool outlet with said outlet of said pump means; and motor means mounted on said frame means for driving said pump means and blower means.

4,112,539

STRUCTURAL-REINFORCEMENT MEANS FOR PRECISION, TELESCOPING, LINEAR SLIDE MECHANISMS

Magnus F. Hagen, 434 Panorama Dr., Laguna Beach, Calif. 92651

Filed May 12, 1976, Ser. No. 685,638
Int. Cl.[2] E05D *13/02*
U.S. Cl. 16—88 **7 Claims**

1. A structural-reinforcement means for precision, telescoping, linear, suspension slides of the type that includes:

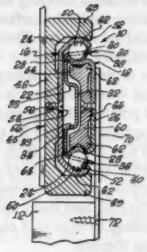
an outer slide member having a bottom wall and inwardly-

formed, ball raceways arranged along the side edges of said bottom wall in a longitudinal, parallel relationship to each other, said raceways being concave in cross-section and facing each other;

an inner slide member having a channel-shaped configuration defined by a bottom wall and oppositely disposed raceways along the side edges thereof, said ball raceways being concave in cross-section and facing outwardly, the inner slide member being operably disposed within the outer slide member;

ball bearings disposed in adjacent raceways of the respective outer and inner slide members;

a ball retainer operably positioned between the outer and inner slide members for retaining said balls in spaced relationship to each other and in said raceways;



an outer, structural-reinforcing bar having a channel-shaped cross section defined by a rear wall and outwardly-extending, flange members integrally formed along the longitudinal side edges of said rear wall, said flanges having a recess formed throughout the length thereof, wherein said outer slide member is fixedly received within said channel of said reinforcing bar, whereby said outer slide is prevented from being misaligned when a load is applied thereto; and

an inner, structural-reinforcing, bar member having an elongated main wall, the longitudinal edges thereof forming a continuous truss member for direct engagement with each oppositely disposed raceway of said inner slide member, said inner reinforcing member being mounted within said channel of said inner slide member, thereby preventing distortion thereof when a load is applied thereto.

4,112,540

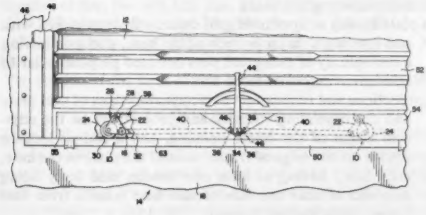
ELEVATING AND SHIFTING RAILWAY CAR SLIDING DOOR MECHANISM

Glenn Lamont Wright, Canfield, and James Arthur Ellis, Columbiana, both of Ohio, assignors to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Jan. 28, 1977, Ser. No. 763,289

Int. Cl.[2] **A47H** *33/02;* **B61D** *17/08, 19/00;* **E05D** *13/02*

U.S. Cl. 16—99 **1 Claim**



1. A mechanism for moving a sliding door of a railway car between a first position in which the bottom surface of the sliding door is supported on the body of the railway car and a second position in which the sliding door is supported by said mechanism and is moveable along the railway car body, said mechanism comprising:

a pair of crank means;

a roller mounted on each of said crank means for rotation about first axes;

means for mounting said crank means to the sliding door for rotation about second axes spaced between said first axes which allow limited arcuate movement of said rollers through a pair of openings in the bottom portion of the sliding door in arcs which provide clearance between said rollers and the openings when said rollers move partially into and out of the openings;

a selectively manually operated actuating member mounted on the sliding door for rotation about a third axis, said actuating member having a pair of lugs thereon;

a pair of single elongated connecting links connected to said crank means for rotation about fourth axes spaced between said second axes and connected to said lugs for rotation about fifth axes spaced from the third axis of rotation of said actuating member;

said third, fourth and fifth named axes being located in the area between the bottom of said rollers and said second axes when said sliding door is in both said first position and said second position, thereby providing a compact and efficient mechanism having the capability of positively selectively driving said door between said first and second positions.

4,112,541

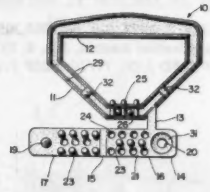
HANDLE FOR BAGS PARTICULARLY OF NET OR PLASTIC MATERIAL

Constantinos Tetradis, 19 Hatzigianni St., Ayos Ioannis Rentis, Attica) Piraeus, Greece

Filed May 31, 1977, Ser. No. 802,171

Int. Cl.[2] **B65D** *33/06*

U.S. Cl. 16—114 R **4 Claims**

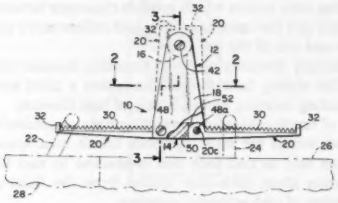


1. A handle for bags particularly of a net or plastic material comprising a carrying member having an elongated closed loop portion adapted to be gripped manually, a link extending perpendicularly from said closed loop and a bendable strip attached to said link spaced from said closed loop and foldable back upon itself to define two portions having opposed inner surfaces, said strip being substantially parallel to said elongated portion of the carrying member, a snap fastener on one strip portion detachably engageable with the other strip portion to engage said strip portion in a clamped position, and means on the opposed inner surfaces of said strip portions for clampingly engaging bag material received between said strip portions, said clamping means comprising a plurality of detents on one of said strip portions and recesses on the other of said strip portions spaced to correspond with said detents, a bag of flexible material having an opening, the bag material at said opening being gathered together and passed between said clamped strip portions to be doubled around a portion of said carrying member to which said link is attached and passed back between said strip portions so that the handle is securely but detachably fastened to said bag when said strip portions are engaged by said snap fastener.

4,112,542
AUXILIARY HANDLE FOR PLURALITY OF CARRYING HANDLES

John M. Snyder, 186 Riverside Dr., New York, N.Y. 10024, assignor to John M. Snyder; Bernard J. Steinberg, both of New York, N.Y. and Edward Halle, Fort Lauderdale, Fla.

Filed Aug. 11, 1977, Ser. No. 823,719
Int. Cl.[2] A45C *13/22*
U.S. Cl. 16—114 R 11 Claims

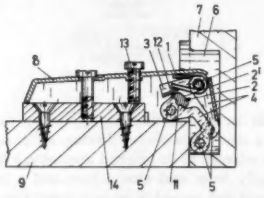


1. An auxiliary handle construction for selective use in carrying a plurality of items comprising primary handles: comprising, a main body portion comprising auxiliary handle, base and connector elements, and holding elements for holding a plurality of said primary handles, in which the holding elements are movable from a first to a second position selectively, the movable holding elements comprise a flat end portion, and the base element comprises at least one flat portion, whereby at least one holding element flat portion and at least one base element flat portion are in faced contacting relation when at least one holding element is in second position.

4,112,543
FURNITURE HINGE

Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft M.B.H., Höchst, Austria

Filed Jun. 3, 1977, Ser. No. 803,305
Claims priority, application Austria, Jun. 4, 1976, 4102/76
Int. Cl.[2] E05D *3/06, 11/10;* E05F *1/12*
U.S. Cl. 16—164 5 Claims

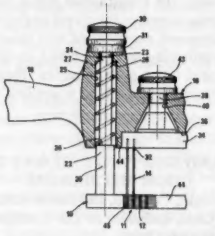


1. A hinge, particularly for use in hingedly connecting a furniture door to an article of furniture, said hinge comprising:
- a hinge arm adapted to be connected to an article of furniture;
- a casing adapted to be connected to a furniture door;
- a first, inner hinge link having first and second opposite ends, said first end of said inner link being pivotally connected to said hinge arm by a first axle, and said second end of said inner link being pivotally connected to said casing by a second axle;
- a second, outer hinge link having first and second opposite ends, said first end of said outer link being pivotally connected to said hinge arm by a third axle, and said second end of said outer link being pivotally connected to said casing by a fourth axle;
- said inner and outer links cooperating to form a quadrangular linkage connecting said casing to said hinge arm, such that said casing is movable about said quadrangular linkage between an open first position and a closed second position;
- an element formed of plastic material and having a curved guiding edge, said element being fixedly positioned on said inner link at a position thereon adjacent the pivotal connection of said first end thereof about said first axle to said hinge arm, with said curved guiding edge facing outwardly away from said first axle, said element having a side surface facing laterally away from said curved guiding edge;
- a metal guiding lever pivotally connected to said third axle, said guiding lever having thereon first and second pressure sections which extend at an angle to each other, said first pressure section contacting said curved guiding edge of said element when said casing is at or moving toward said open first position thereof, and said second pressure section contacting said side surface of said element when said casing is at or closely adjacent said closed second position thereof; and
- spring means for urging said guiding lever toward said element, such that when said casing is at or moving toward said open first position thereof said spring means and said first pressure section produce no torque urging said inner link about said first axle, and such that when said casing is at or closely adjacent said closed second position thereof said spring means and said second pressure section produce a torque urging said inner link about said first axle in a direction tending to urge said casing toward said closed second position thereof.

4,112,544
TENDERIZER FOR BUTCHER'S MEAT

Philippe d'Arras, Paris, France, assignor to Societe Coupax, Selles Sur Cher, France

Filed Dec. 30, 1976, Ser. No. 755,825
Claims priority, application France, Jan. 8, 1976, 76 00328
Int. Cl.[2] A22C *9/00*
U.S. Cl. 17—25 2 Claims



1. An appliance for tenderizing butcher's meat, comprising:
- a base including an open frame and, a lower major surface for contacting the meat;
- a plate having an apertured grid detachably interlocked with and forming a major portion of the base, said grid having a multiplicity of elongated slots oriented perpendicular to said lower major surface;
- projections and recesses on two opposite edges of said plate and corresponding recesses and projections on the adjacent edges of the frame opening, and a sliding locking device on one edge of frame, to hold the plate in the base;
- a main body having at least one handle, said body being disposed of near one side of said base remote from said lower major surface thereof;
- an elongated upright secured to said base and slidably connected to said main body to permit linear sliding movement between said base and said body;
- a spring for urging said upright away from said main body;

said main body having a recess therein for receiving a blade assembly;

a blade assembly comprising a block of plastic material having a mounting surface and an opposite blade holding surface said assembly being detachably interlockably secured to said main body with said block disposed in said recess and said mounting surface abutting a wall of said recess, said blade holding surface being generally parallel to said lower major surface of said base;

a corresponding multiplicity of elongated blades each having one end embedded in said plastic block at said blade holding surface thereof and a free end adjacent said lower major surface, each blade being in alignment with and extending through a corresponding aperture of said grid,

whereby said main body may be moved toward said base to cause said blade to extend through said slots and beyond said lower major surface to tenderize said meat, said spring returning said body to a rest position wherein said free ends of said blades are disposed within said slots, and said plate and said blade assembly may be readily removed from said base and main body respectively for cleaning purposes.

4,112,545

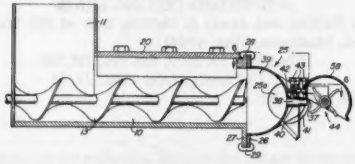
METHOD AND APPARATUS FOR FORMING TORN, RANDOM SIZE PIECES OF SAUSAGE MEAT

Wayne L. Covington, and Glen R. Green, both of Ontario, Oreg., assignors to Ore-Ida Foods, Inc., Boise, Id.

Filed Feb. 3, 1977, Ser. No. 765,100

Int. Cl.² A22C *7/00*

U.S. Cl. 17—45 **8 Claims**



1. A method of forming random size pieces of a chopped or ground sausage meat or like material, comprising the steps of continuously extruding, as a continuous column, material of the type specified through an extrusion passage having an unrestricted outlet opening freely into an extrudate-receiving space; and successively and repeatedly tearing respective chunks of material from the extruded column as said column emerges from said outlet, by passing wiping means across different fractional portions of the extrusion outlet.

4,112,546

METHOD OF AND APPARATUS FOR MAKING LINK SAUSAGES

Johann Müller, Biberach, Germany, assignor to Firma Albert Handtmann, Biberach, Germany

Division of Ser. No. 540,722, Jan. 13, 1975, Pat. No. 4,021,885. This application Sep. 30, 1976, Ser. No. 728,190

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1974, 2402817

The portion of the term of this patent subsequent to May 10, 1994, has been disclaimed.

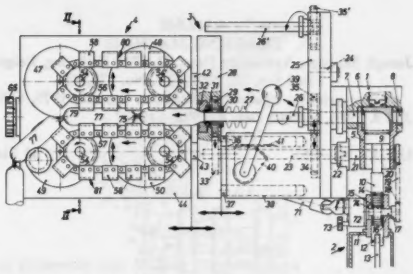
Int. Cl.² A22C *11/00, 11/04, 11/10*

U.S. Cl. 17—49 **15 Claims**

1. In a method of making sausage links of uniform length and weight in a common sausage casing wherein individual portions are formed by rotating the empty portion of the sausage casing relative to the prepared links which are prevented from rotating and which are radially gripped at the filled portions and advanced with an adjustable speed, the improvement which comprises the steps of:

subdividing the sausage casing into the individual portions by twisting off the sausage casing with intermittent control of the twisting operation dependent upon the volume of the sausage filling fed during the previous interval;

establishing the length of the sausage links solely by varying the advancing speed of the filled portions by engaging them with a conveyor free from projections separating links from one another;



effecting the filling of the links and the drawing off of the sausage casing alternately and synchronously with the twisting off operation; and

synchronously changing the speed of advance of the filled sausage lengths in the same sense as the pulsating ejection speed of the sausage filling mass.

4,112,547

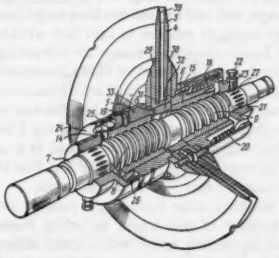
AUTOMATICALLY ADJUSTABLE CUTTING APPARATUS FOR PURPOSES SUCH AS FILLETING FISH

Alexandra Ivanovich Glushkov, Ulitsa Sofii, perovskoi, 18, kv.5; Sergei Vasilievich Krutov, Kolsky prospekt, 20, kv.45; Vladimir Ivanovich Semenov, Ulitsa Gadzhieva, 11, kv.17; Anatoly Fedorovich Gusev, prospekt Lenina, 46, kv.26, all of Murmansk, U.S.S.R.

Filed Dec. 21, 1976, Ser. No. 752,999

Int. Cl.² A22C *25/16*

U.S. Cl. 17—57 **10 Claims**



1. In an automatically adjustable cutting apparatus, such as a fish filleting apparatus, rotary shaft means and a pair of disc-shaped cutting means coaxially mounted on said shaft means for rotation therewith and axially spaced from each other to define between themselves a predetermined gap through which material such as the spine and bones of a fish can pass, thread means formed on said shaft means and at least at one of said cutting means for providing at least at said one cutting means not only rotation with said shaft means but also the possibility of turning relative to said shaft means for changing the width of said gap, and spring means connected between said one cutting means and said shaft means for yieldably and resiliently resisting turning of said one cutting means with respect to said shaft means, said spring means yielding when said one cutting means encounters a sufficient resistance to

turning together with said shaft means, for providing then for relative turning of said one cutting means with respect to said shaft means at said thread means in a direction which will increase the width of said gap, said spring means operating when said resistance diminishes to return said one cutting means with respect to said shaft means back toward an initial position of said one cutting means on said shaft means.

4,112,548

DRAFTING MACHINE

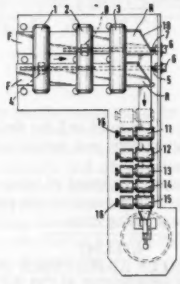
Joseph Sauvage, Avenue de Parc, 57, 4920 Embourg, Belgium

Filed Sep. 22, 1976, Ser. No. 725,668

Claims priority, application Belgium, Sep. 23, 1975, 645181; Jul. 9, 1976, 645597; Dec. 4, 1975, 645280

Int. Cl.[2] D01H *5/00*

U.S. Cl. 19—243 **24 Claims**



1. A machine for blending, matting, shortening or sizing natural or artificial fibers, comprising

a first and second working stage, each of said stages comprising a plurality of trains of rollers adapted to perform work, each of said trains consisting of three rollers including an upper presser roller and two twin carrier rollers under said presser roller,

said plurality of trains including, a plurality of single heads and twin carrier rollers of large size constituting said first working stage, and said second working stage sequentially operatively arranged relative to said first working stage, said single heads comprising means for delivering at least two separated webs of slivers of fibers therethrough,

means for forming a narrow thick lap constituting directional juxtaposing members for feeding the two separated webs emerging from said single heads along a horizontal plane towards said second working stage in a combined single lap having a width at least 50% less than the width of an individual of said two separated webs,

said second working stage including a reducer head comprising a number of said trains, including frames and a twin lower supporting roller and control roller, respectively, overhangingly mounted on said frames, adjustably spaced from each other.

4,112,549

APPARATUS FOR DEFLOCCULATING FIBROUS WAD AND UNIFORMLY DISTRIBUTING THE DISINTEGRATED FIBROUS MATERIAL ON A DRY FIBER LAYER FORMING SURFACE

Tony C. Min, Houghton, Mich., and Richard E. Hergert, Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Sep. 19, 1977, Ser. No. 834,788

Int. Cl.[2] D04H *1/00*

U.S. Cl. 19—304 **6 Claims**

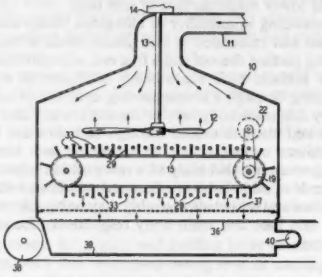
1. An apparatus for deflocculating a dry suspension of fibers which comprises:

a housing,

inlet means for introducing said suspension of fibers vertically into said housing for free fall therethrough,

an impeller positioned below said inlet means and in the path of the falling suspension of fibers,

drive means for rotating said impeller in a manner such that it provides vertically upward directed air currents in



opposition to the settling tendencies of said suspension of fibers,

a foraminous forming means below said impeller means, and

suction means acting on said foraminous forming means to form a sheet of fibers from the fibers settling onto said forming means.

4,112,550

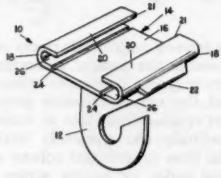
SUSPENDED CEILING HOOK

Stuart DeWitt, and James S. DeWitt, both of 799 Wendover Blvd., Muskegon, Mich. 49441

Filed May 13, 1977, Ser. No. 796,765

Int. Cl.[2] A44B *21/00*; E04C *17/18*

U.S. Cl. 24—73 BP **9 Claims**



1. A hanger device for attachment to a support member with a rim with two outwardly extending planar edges comprising:

an integrally formed upper portion including two inwardly extending and opposing flanges having inner edges spaced apart from each other and means defining a flexure point for each of said opposing flanges;

a recess formed within the upper portion with the inwardly extending flanges defining the upper border of the recess, the recess adapted to receive the rim of the support member;

tab means for manually moving the flanges outwardly about the flexure point to enlarge the distance between the inner edges to allow the rim of the support member to be received in or withdrawn from the recess, the tab means connected to the outer portion of the upper portion and extending downwardly and outwardly therefrom for manual movement to inward positions such that the flanges move resiliently about the flexure point when the tab means are manually moved inwardly, the flanges being adapted to securely engage the rim of the support member when the tab means are released; and

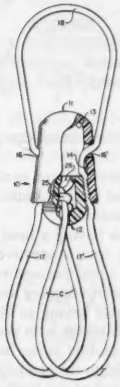
a downwardly extending hanger portion connected to the upper portion.

4,112,551

DRAW STRINGS PULLER AND FASTENER

Buenaventura Z. Sales, 5234 Westmont Ave., San Jose, Calif. 95130

Filed Feb. 24, 1977, Ser. No. 771,622
Int. Cl.² F16G *11/14, 11/10*
U.S. Cl. 24—117 **5 Claims**



1. A draw string puller and fastener for a draw string engaging a hem, eyelets, hooks, and the like of a closable member comprising in combination:

1. a cord having a mid portion interlacingly circumscribing such closable member;
2. a cap member having a bell like body with a closed end from which a resilient flared cylindrical wall extends toward an open end;
3. a pair of apertures formed through the closed end of said cap member through which the free ends of said cord slidingly pass and extend for opening and closing the looped mid portion thereof relative to said closable member;
4. a plug element having a closed end from which a tapered opposite end extends, a bore formed through said plug element for passage of the terminal ends of said cord therethrough, and a cavity formed in the tapered opposite end of said plug element;
5. a knot formed on the terminal ends of said cord for tying them together beyond said plug element for manually pulling the extended ends of said cord away from the cap member as it is held in abutting relation relative to the closable member for closing the looped mid portion of the cord upon the latter; and

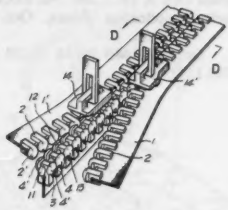
6. said tapered opposite end of said plug element conforming to the internal surface of said resilient flared cylindrical wall of said cap member and adapted for pressed fit into the open end of said cap member to thereby retain the free ends of said looped cord in juxta-position therebetween and the looped mid portion of said cord in closed condition relative to said closable member.

4,112,552

THREE-WAY SLIDE FASTENER

Haeng Yong Lee, 1091, Seocho-dong, Kangnam-ku, Seoul, Korea

Filed Aug. 24, 1976, Ser. No. 717,180
Claims priority, application Rep. of Korea, Aug. 27, 1975, 1896
Int. Cl.² A44B *19/02, 19/04*
U.S. Cl. 24—205 R **4 Claims**



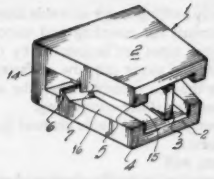
1. A three-way slide fastener comprising:
first flank means for providing a first row of single head teeth elements;
second flank means for providing a second row of single head teeth elements;
intermediate tape means for providing a row of teeth elements each element being a dual head; and
slider means for selectively interlocking and releasing said first and second flank means to and from said intermediate tape means wherein said slider means is comprised of two independently operable sliders, each slider capable of selectively interlocking and releasing only one of said flank means to and from said tape means.

4,112,553

SLIDE FASTENER BOTTOM ENDS

Jonas Weitzner, Cespedes 3857, Buenos Aires, Argentina

Filed Feb. 22, 1977, Ser. No. 770,375
Claims priority, application Argentina, May 28, 1976, 263438
Int. Cl.² A44B *19/36*
U.S. Cl. 24—205.11 R **5 Claims**



1. A stop member for retaining the two ends of a slide fastener, at least one end having a surface with at least one locking recess defined thereon, comprising, a top and bottom face portion spaced from and facing each other, a web portion connected between adjacent edges of said top and bottom face portions, said face portions and web portion forming a groove, a partition connected between said top and bottom face portions dividing said groove into first and second groove spaces for admitting the respective ends of the slide fastener, flange means extending into said groove from lateral edges of said top and bottom face portions to form a slot therebetween in each groove space, and at least one of said flange means in said first groove space including at least one tooth extending into said slot, said tooth having an inclined surface sloping inwardly toward said slot in the direction of said web portion, and having a vertical surface facing said web, the slide fastener end having at least one recess thereon being lockably engageable

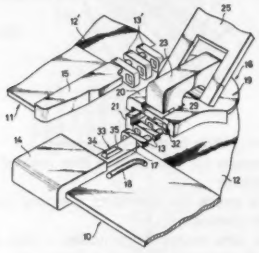
into said first groove space by said tooth engaging into said recess.

4,112,554

SEPARABLE SLIDE FASTENER WITH AN AUTOMATICALLY LOCKING SLIDER

Kazumi Kasai, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Oct. 5, 1977, Ser. No. 839,438
Claims priority, application Japan, Oct. 13, 1976, 51-137352[U]
Int. Cl.[2] A44B *19/36, 19/30*
U.S. Cl. 24—205.11 R **5 Claims**



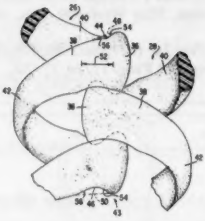
1. A separable slide fastener comprising, in combination:
(a) a pair of complementary stringer tapes;
(b) rows of interlocking fastener elements affixed respectively to the confronting longitudinal edges of the stringer tapes;
(c) separable coupling means for connecting and disconnecting the stringer tapes, the separable coupling means comprising:
(1) a pin member secured to the fastener element-carrying edge of one of the stringer tapes under the row of fastener elements thereon; and
(2) a box member secured to the fastener element-carrying edge of the other stringer tape under the row of fastener elements thereon, the box member being adapted to receive the pin member when the stringer tapes are connected;
(d) an automatically locking slider movable along both rows of fastener elements for coupling and uncoupling same when the stringer tapes are connected by the separable coupling means, and along the row of fastener elements associated with the box member when the stringer tapes are disconnected, the slider comprising:
(1) a body defining therein a guide channel for the rows of fastener elements;
(2) spring means; and
(3) a locking member pivotally supported at one end on the slider body and having first and second legs formed adjacent its other end, the first leg of the locking member being normally biased by the spring means into a position of interference with the row of fastener elements associated with the pin member when the slider is riding on both rows of fastener elements, the second leg of the locking member being normally biased by the spring means toward the row of fastener elements associated with the box member and being restrained from locking engagement therewith; and
(e) means on the box member of the separable coupling means for retracting the first leg of the locking member away from its interference position by engaging the second leg of the locking member and causing the latter to move against the bias of the spring means when the slider is moved into abutting contact with the box member;
(f) whereby the pin member of the separable coupling means can be smoothly inserted into the box member thereof through the slider for connecting the pair of stringer tapes while the slider is held in abutting contact with the box member.

4,112,555

SLIDE FASTENER

George B. Moertel, Crawford, Pa., assignor to Textron Inc., Providence, R.I.

Division of Ser. No. 539,802, Jan. 9, 1975, Pat. No. 4,044,431.
This application Jun. 14, 1977, Ser. No. 806,487
Int. Cl.[2] A44B *19/12*
U.S. Cl. 24—205.13 C **4 Claims**



1. A stringer for a slide fastener comprising
a tape;
a spiral coupling member secured to one longitudinal edge of the tape and formed from a continuous filament into successive coupling sections;
each coupling section having a head portion, a pair of leg portions extending from respective opposite sides of the head portion, and a heel portion interconnecting to a leg portion of an adjacent coupling section,
said continuous filament having an oblate cross section perpendicular to the filament with the longest dimension of the filament cross section in the head portions extending substantially parallel to the one edge of the tape and with the longest dimension of the filament cross section in the leg portions revolving from substantially parallel to the one edge of the tape at the head portions to an oblique angle to the tape at the heel portions;
each of said leg portions having a notch contiguous the respective head portion to reduce the longest dimension of the filament cross section; and
said notches having generally obtuse and scalene triangular cross sections with the head portions bordering the shortest side of the notch cross sections and with the leg portions bordering the next shortest side of the notch cross sections.

4,112,556

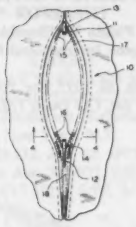
ZIPPER CONSTRUCTION

Dennis Michael Flaum, 1 E. Schiller, Chicago, Ill. 60610, and Herman Lawrence Fleishman, 6518 N. Kenton, Lincolnwood, Ill. 60645

Filed Sep. 14, 1977, Ser. No. 833,003
Int. Cl.[2] A44B *19/34, 19/00*
U.S. Cl. 24—205.1 R **4 Claims**

1. A closure fashioned from slide fasteners, each of said slide fasteners including two ribbons, each said ribbon having thereon a series of interconnectable elements alternatingly positioned and spaced apart, and a slider which is moved along said two ribbons in a first direction to open or in a second direction to close said fasteners by deinterconnecting or interconnecting said two series of interconnectable elements, said closure comprising:
a plurality of said slide fasteners arranged to abut one another in parallel stacked alignment,
each said slide fastener oriented to open in a direction oppo-

site that of its immediately suprajacent or subjacent partner,



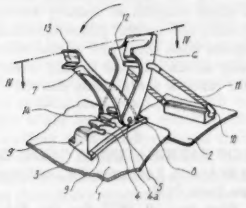
said ribbons of each said slide fastener being attached directly to the corresponding of said ribbons on said immediately said subjacent or suprajacent partner.

4,112,557

DEVICES FOR FASTENING SKI BOOTS

Georges Pierre Joseph Salomon, Annecy, France, assignor to S.A. des Etablissements Francois Salomon & Fils, Annecy, France

Filed Aug. 19, 1977, Ser. No. 826,941
Claims priority, application France, Sep. 7, 1976, 76 26829
Int. Cl.[2] A43C *11/14*
U.S. Cl. 24—69 SK **14 Claims**



1. A fastening device for a ski boot comprising a toggle for drawing two edges of said boot together and including a rack for fixing to a first edge of the boot and having at least one notch, a clamping lever integral with an engagement pin also constituting a pivot pin for the lever engaging in said notch of said rack, a traction member pivoted, on the one hand, to a second edge of the boot and, on the other hand, to the clamping lever, the latter being able to occupy a first position in which it is closed flat on the boot, a second stable intermediate walking position, or position of partial opening and a third position of complete opening in which the engagement pin is released from the notch, and an unlocking lever having a positive action, pivoted on the rack or clamping lever, and whose pivotal movement causes the removal of the engagement pin of the clamping lever from the notch of the rack in which this pin was housed.

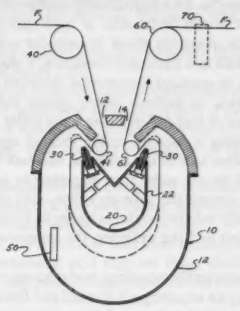
4,112,558

FABRIC BULKING PROCESS

Donald K. Christian, 119 Woodbine Ter., Spartanburg, S.C. 29301

Continuation-in-part of Ser. No. 409,180, Oct. 24, 1973, Pat. No. 3,925,865. This application Dec. 15, 1975, Ser. No. 640,421
Int. Cl.[2] D06C *1/00*
U.S. Cl. 26—18.5 **6 Claims**

1. A method for bulking a textile fabric comprising feeding the fabric under a restraining means into a treating vessel having two upwardly oriented nozzles therein at predetermined angles withdrawing the fabric passing in transit under said restraining means, over an upwardly oriented nozzle, under a pressure manifold system which supplies the nozzles, over another upwardly oriented nozzle and under another restraining means thus forming a downwardly extending loop



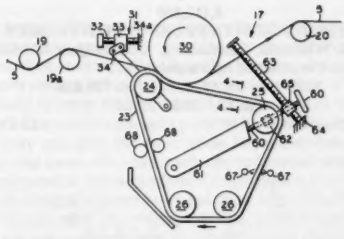
within the vessel, said loop generally encircling the pressure manifold system, the said loop being suspended from and formed solely by an upwardly directed gaseous flow from said nozzles, the fabric being bulked by actions induced therein by said air streams within the treating vessel.

4,112,559

APPARATUS FOR COMPRESSIVELY SHRINKING TEXTILE FABRICS AT HIGH SPEED

Walter S. Troope, Latham, and Jackson Lawrence, West Sand Lake, both of N.Y., assignors to Cluett, Peabody & Co., Inc., New York, N.Y.

Division of Ser. No. 354,708, Apr. 26, 1973, Pat. No. 3,940,833. This application Jun. 30, 1975, Ser. No. 591,293
Int. Cl.[2] D06C *21/00*
U.S. Cl. 26—18.6 **3 Claims**



1. In an apparatus for longitudinally compressively shrinking a light weight textile fabric web at high speed and having a heated cylinder, rotatable about its cylinder axis and having a hard surface with low frictional resistance, a plurality of rollers each of which is mounted for rotation about an axis parallel to the cylinder axis, an endless rubber elastic belt trained over said rollers, one of said rollers being a nip roller and another of said rollers being a take-up roller located opposite the nip roller on the other side of the cylinder, said belt being wrapped in turn around the nip roller then engaging an arc of the cylinder and then around the take-up roller, said nip roller being movable substantially only radially relative to the cylinder to variably compress the belt against the cylinder, the improvement comprising:

link means swingably mounting said take-up roller for movement along an arcuate path toward and from said cylinder, said arcuate path being concave toward said nip roller and configured such that movement of said take-up roller therealong will vary the length of the arc of contact be-

tween said belt and cylinder without substantially changing the tension in said belt; and

selectively operable means for swinging said link means to move said take-up roller along said arcuate path.

2. In an apparatus for longitudinally compressively shrinking a light weight textile fabric web at high speed and having a heated cylinder, rotatable about its cylinder axis and having a hard surface with low frictional resistance, a plurality of rollers each of which is mounted for rotation about an axis parallel to the cylinder axis, an endless rubber elastic belt trained over said rollers, one of said rollers being a nip roller and another of said rollers being a take-up roller located opposite the nip roller on the other side of the cylinder, said belt being wrapped in turn around the nip roller then engaging an arc of the cylinder and then around the take-up roller, said nip roller being movable radially relative to the cylinder to form a variable nip between the belt and the cylinder, the improvement comprising:

link means swingably mounting said take-up roller for movement along an arcuate path toward and from said cylinder, said arcuate path being such that movement of said take-up roller therealong will vary the length of the arc of contact between said belt and cylinder without substantially changing the tension in said belt;

selectively operable means for swinging said link means to move said take-up roller along said arcuate path; and

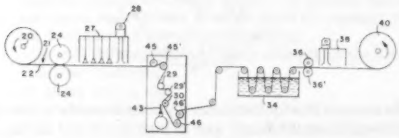
further selectively operable means for adjusting the position of said take-up roller along said link means to thereby change the radius of said arcuate path and the tension in said belt.

4,112,560

METHOD FOR SCULPTURING PILE FABRICS

Charles E. Willbanks, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 15, 1976, Ser. No. 750,618
Int. Cl.[2] D06C *23/02*
U.S. Cl. 28—160 **15 Claims**



1. A method of trimming the fibers in the pile from selected regions of pile fabrics comprising the steps of:

applying stiffening agent only to the regions of the fabric in which the pile is to be trimmed while leaving other regions unstiffened;

hardening the stiffening agent; and

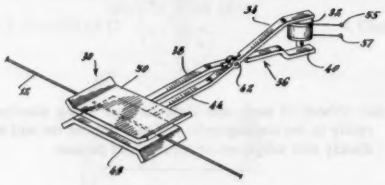
passing the fabric over a support member closely adjacent to a blade which contacts the fibers both in the regions to which stiffening agent has been applied and the unstiffened regions but severs only the fibers in the regions to which stiffening agent has been applied and deflects without severing the fibers in those regions to which stiffening has not been applied, said blade cutting in the same fashion as a knife or razor as opposed to cutting like a pair of scissors.

4,112,561

APPARATUS FOR MANUFACTURING FILAMENTS OF VARYING DENIER AND ACTUATING MEANS THEREFOR

Alan H. Norris, and Phillip W. Chambley, both of Rome, Ga., assignors to Champion International Corporation, Stamford, Conn.

Filed Feb. 24, 1977, Ser. No. 771,425
Int. Cl.[2] D02J *1/22*
U.S. Cl. 28—243 **8 Claims**



1. An apparatus for fabricating a filament exhibiting variations in denier along its length comprising:

(a) means to propel a running length of filament from a feed roller to a draw roller;

(b) electrically activated tension means disposed between said feed roller and said draw roller intermittently engaging said filament for providing variable tension thereon, said electrically activated tension means comprising solenoid means including a solenoid coupled to first and second contact plates in juxtaposition, said first and second contact plates adapted to slidably receive said filament therebetween said contact plates increasing the tension on said filament upon activation of said solenoid, and

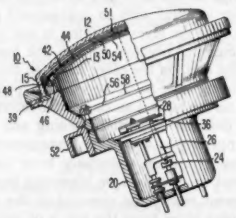
(c) actuating means coupled to said electrically activated means for random energization thereof.

4,112,562

PROCESS OF FABRICATING A CATHODE RAY TUBE

Ralph James D'Amato, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 10, 1977, Ser. No. 823,336
Int. Cl.[2] H01J *9/02, 9/227*
U.S. Cl. 29—25.14 **9 Claims**



1. In a process of fabricating a cathode-ray tube having a faceplate panel and an apertured color selection electrode mounted to said panel, the improvement comprising,

exposing a photosensitive coating on a surface of said panel with actinic radiation passed through a patterned screen master,

developing the exposed photosensitive coating on said panel,

then mounting a formed imperforate member to said panel, said imperforate member having a photosensitive coating thereon,

subsequently exposing the photosensitive coating on said imperforate member with actinic radiation passed through a patterned color selection electrode master while said imperforate member is mounted to said panel,

developing said exposed photosensitive coating on said imperforate member, and

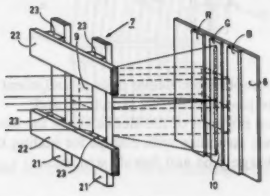
etching said imperforate member to form an apertured color selection electrode.

4,112,563

COLOR DISPLAY TUBE AND METHOD OF MANUFACTURING SAME

Johannes Van Esdonk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 759,111, Jan. 13, 1977, Pat. No. 4,066,923.
This application Aug. 8, 1977, Ser. No. 822,733
Int. Cl.[2] H01J *9/02, 9/18*
U.S. Cl. 29—25.14 **8 Claims**



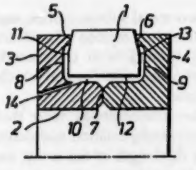
1. In the method of manufacturing a color selection means of a first and second system of electrodes for a color display television tube comprising a pair of metal electrodes with aperatures used to focus electron beams, said electrodes being separated by an insulating spacing member, at least one of said apertured metal electrodes being initially separate from said insulating spacer member, the steps comprising providing a metallic coating on at least one surface of the insulating member, placing an apertured electrode in contact with said metallic coating, heating said electrode and said insulating member with the metallic coating in contact therewith and applying sufficient pressure while heating to effect a diffusion bond therebetween providing the other aperatured electrode on an opposite surface of said insulating member, and thereafter selectively etching said metallic coating and insulating member to form apertures therein corresponding to those in said electrodes.

4,112,564

METHOD OF MAKING A COMPOSITE ROLLER

Kaj-Ragnar Loqvist, Fagersta, Sweden, assignor to Seco Tools Aktiebolag, Fagersta, Sweden

Continuation-in-part of Ser. No. 654,415, Feb. 2, 1976, abandoned. This application Apr. 13, 1977, Ser. No. 787,213
Claims priority, application Sweden, Jan. 31, 1975, 7501066
Int. Cl.[2] B21D *53/12;* **B21B** *31/08;* **B60B** *7/04, 11/04*
U.S. Cl. 29—148.4 D **5 Claims**



1. A method of making a roller for hot and cold rolling comprising the steps of:

providing a wear ring (1) of hard metal having outwardly convergent conical end parts, the cross-section of which decreases radially outwardly: providing a supporting structure composed of two supporting rings (3,4) L-shaped in cross-section; positioning the wear ring between said supporting rings with its conical outer parts in abutment with corresponding conical abutment surfaces (5,6) on said supporting rings;

said positioning being such as to bring said support rings into abutment at end surfaces (7) of opposed leg portions of said support rings, while leaving

a closed U-space (10) between the wear ring and said support rings;

positioning the whole composite structure thus produced on a bottom support (25);

providing a high frequency electric induction coil (20) interiorly of said composite structure which is caused to effect heating and welding at surfaces (7) for a predetermined time period, thus causing expansion of said composite structure;

applying pressure on said composite structure against said bottom support (25) so as to bring said support rings back to their position before expansion; and

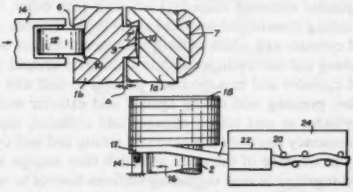
switching off the induction coil, thus cooling the composite structure whereby said support rings shrink against the wear ring and exert compressive forces thereto.

4,112,565

METHOD OF MAKING STRIP-COVERED ROLL

Vaino Sailas, Vaajakoski, Finland, assignor to Valmet Oy, Finland

Filed Jun. 28, 1977, Ser. No. 811,136
Claims priority, application Finland, Jun. 30, 1976, 761903
Int. Cl.[2] B21D *53/12;* **B21H** *1/12;* **B21K** *1/02*
U.S. Cl. 29—148.4 D **6 Claims**



1. A method of manufacturing a roll of the type suitable for use in a paper machine, comprising the steps of successively surrounding an inner roll body with a plurality of circumferential strip portions which engage an exterior surface of the inner roll body to cover the latter at said exterior surface thereof, so that said circumferential strip portions become situated on said roll body one after the other while being distributed axially along said inner roll body, each circumferential strip portion being formed at one circumferential side surface thereof with a groove situated between inner and outer edges of said one side surface and each circumferential strip portion having at an opposed side surface thereof in circumferential alignment with said groove an integral circumferential projection of predetermined cross-sectional configuration, said groove of each circumferential strip portion having at said one side surface thereof a radial dimension with respect to the axis of said inner roll body which is smaller than a radial dimension of said groove in the interior thereof spaced from said one side surface of each circumferential strip portion, and the radial dimension of said circumferential projection of each strip portion initially being small enough for each circumferential strip portion to enter into the groove of an adjoining strip portion while initially engaging said adjoining strip portion in the interior of said groove thereof in a manner preventing said adjoining strip portion from engaging at said one side surface thereof the adjoining side surface of the circumferential strip portion whose projection is received in said groove of said adjoining strip portion, so that initially there is a gap between adjoining strip portions at said side surfaces thereof, and pressing said adjoining strip portions into engagement with each other at said adjoining side surfaces thereof while simultaneously de-

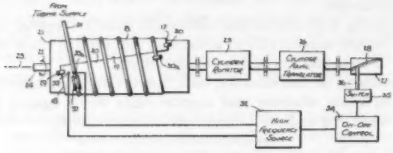
forming said projection to fill said groove, so as to interlock adjoining strip portions.

4,112,566

METHOD OF MANUFACTURING HEAT EXCHANGE PANELS

Clayton DuBosque, Jr.; Wallace C. Rudd, both of New Canaan, Conn., and Richard J. Allen, New Rochelle, N.Y., assignors to Thermatool Corp., Stamford, Conn.

Filed Apr. 25, 1977, Ser. No. 790,330
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 C **10 Claims**



1. A method for making a heat exchange panel comprising a sheet of metal having end edges and side edges and having several laterally spaced apart, finite lengths of metal tubing secured by welding to said sheet except at opposite end portions thereof which lengths of opposite end portions are small relative to said finite lengths, said lengths of tubing extending in the direction from one said end edge to the other of said end edges, said method comprising forming said sheet into a hollow cylinder with said end edges adjacent each other, feeding metal tubing toward and into contact with the exterior surface of said cylinder and while causing relative movement between said tubing and said cylinder both in a direction around the axis of said cylinder and in a direction parallel to said axis of said cylinder, pressing said tubing against said exterior surface of said cylinder as said tubing engages said cylinder, supplying high frequency electric current to said tubing and said cylinder shortly in advance of the point at which they engage and are pressed together to heat the facing surfaces thereof to welding temperature by the time they engage thereby forming a continuous weld between said tubing and said cylinder during the time that high frequency current is supplied to said tubing and said cylinder, interrupting the supply of current to said tubing and said cylinder so that from shortly before to shortly after said end edges pass beneath said tubing, welding of portions of said tubing to said cylinder is prevented, said portions extending circumferentially of said cylinder, being adjacent to said end edges and being small relative to the circumference of said cylinder, and after a plurality of rotations of said cylinder severing said portions of said tubing above said end edges and discontinuing the welding of said tubing to said cylinder to provide a panel having said lengths of tubing welded thereto except at said opposite end portions, and thereafter, forming the cylinder with the tubing welded thereto to the desired shape.

4,112,567

METHOD OF INSTALLING PLUMBING

John Bretone, Jr., 91 Woodview Rd., West Hempstead, N.Y. 11552

Division of Ser. No. 610,863, Sep. 5, 1975, Pat. No. 4,038,737. This application May 26, 1977, Ser. No. 800,794
Int. Cl.[2] B21D *53/00*; B21K *29/00*; B23P *15/26*
U.S. Cl. 29—157 R **6 Claims**

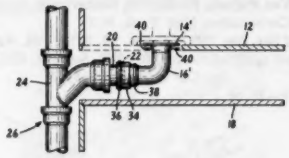
1. A method of installing a discharge pipe which extends from a toilet to a ferrule structure projecting from a section of a sewage system, the method comprising the steps of:

obtaining access to the space for the discharge pipe at the ferrule structure by leaving incomplete a portion of a floor adjacent the location for the toilet;

installing the ferrule structure with a bead about the end which projects from the section of the sewage system;

positioning the discharge pipe with one end adjacent the ferrule structure and the other end positioned for connection to the toilet;

attaching a flange to the other end of the discharge pipe for connecting and sealing the discharge pipe to the toilet;



placing a compressible sleeve over the adjacent ends of the discharge pipe and ferrule structure; and

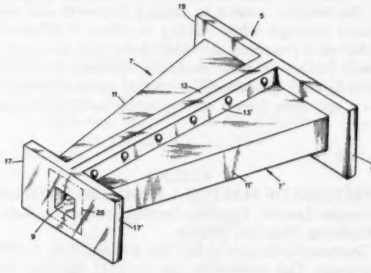
compressing portions of the sleeve about the discharge pipe and ferrule structure with clamps for sealing the sleeve to the discharge pipe and ferrule structure.

4,112,568

METHOD OF FABRICATING A FLOW DEVICE

Robert L. Hale, Kingston, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 1, 1977, Ser. No. 802,346
Int. Cl.[2] B23P *15/00*
U.S. Cl. 29—157 C **8 Claims**



1. The method of fabricating a tubular metal article comprising:

(a) providing two metal subassemblies, each corresponding to a longitudinal half-section of said article, each subassembly being formed with transversely extending end flanges and opposed side flanges which extend between said end flanges;

(b) arraying the subassemblies with their corresponding flanges in confronting relation and defining two channels extending for the length of the array, and with elongated gaskets positioned in the channels, said gaskets being composed of metal capable of forming a fusion bond with the subassemblies;

(c) mechanically joining the confronting side flanges of the subassemblies to deform said gaskets and longitudinally seal the resulting tubular assembly; and

(d) fusing the end portions of said gaskets to portions of said end flanges contiguous therewith to transversely seal said assembly.

4,112,569

METHOD OF MANUFACTURING A HEAT EXCHANGER

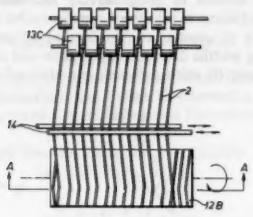
Peter Heinrich Erwin Margen, and Rolf Paul Naslund, both of Nykoping, Sweden, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

Division of Ser. No. 681,471, Apr. 29, 1976. This application Nov. 15, 1976, Ser. No. 742,215

Claims priority, application Sweden, May 7, 1975, 7505362

Int. Cl.[2] B23P *15/26*; B22C *17/00*

U.S. Cl. 29—157.3 R **6 Claims**



1. A method for producing a heat-exchanger tube coil comprising:

(a) providing a plurality of sources of tubes;

(b) axially withdrawing a plurality of said tubes from a corresponding number of said sources;

(c) arranging said tubes in a spaced, parallel array;

(d) winding said tube array onto a support core having a central axis to produce a plurality of parallel, spaced, helical windings, said windings being at an angle to a plane normal to said support core axis; and

(e) reversing the pitch angle of said tube array to said plane at an odd number of fixed radial angle positions around the circumference of the support core during each winding revolution, the angle formed by the array in the reverse direction being substantially the mirror image of the angle of winding in the forward direction, whereby the separate tubes of individual winding turns are guided by the spaces between the tubes of a corresponding preceding winding turn at said fixed angle positions.

4,112,570

APPARATUS FOR FORMING A JOINT FOR WIRE CLOTH

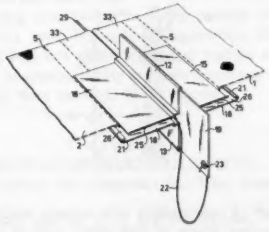
Einar Gustav-Vilhelm Svensson, Halmstad, Sweden, assignor to Wallbergs Fabriks AB, Halmstad, Sweden

Filed Feb. 24, 1976, Ser. No. 660,933

Claims priority, application Sweden, Mar. 10, 1975, 7502616

Int. Cl.[2] B23P *19/04*

U.S. Cl. 29—241 **4 Claims**



1. Apparatus for joining two wire cloth ends to form a wire cloth joint, the ends each having a folded portion joined to its respective wire cloth by seams or the like, and the folded portion of one wire cloth having attached to its edge an endless wire screw extending along the wire cloth end and with said screw having loops lying freely outside the end, said apparatus comprising guide means for acting against the folded portions of the respective wire cloth ends for pressing free portions of the wire screw into spaces between warp wire loops along the edge of the end portion of the other wire cloth, said guide means comprising first upper and lower guide members spaced apart to accommodate said one wire cloth end therebetween and second upper and lower guide members spaced apart to accommodate said other wire cloth end therebetween, means interconnecting said first guide members with said second guide members and defining a passage for accommodating said warp wire loops in an opened-out condition, said passage having a depth greater than the spacing between the respective upper and lower guide members, and a substantially U-shaped bar longitudinally slidable into said passage for holding open said warp wire loops to maintain them in said opened-out condition for the insertion of a locking wire through said loops and through the pressed-in portions of the wire screw.

4,112,571

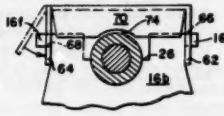
KEEPER FOR IDLER ROLLS

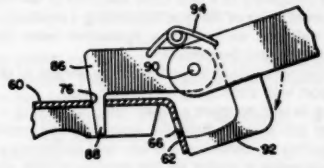
Ralph W. Coutant, Ridgewood, N.J., assignor to Litton Systems, Inc.

Division of Ser. No. 620,771, Oct. 8, 1975, Pat. No. 4,048,207, which is a division of Ser. No. 446,009, Feb. 25, 1974, Pat. No. 3,934,711. This application Mar. 25, 1977, Ser. No. 781,318

Int. Cl.[2] B23P *11/00*

U.S. Cl. 29—243.5 **11 Claims**





1. In combination, a keeper for use with an idler roll set and a manual tool for installing the keeper,

1. said keeper comprising:

(a) a planar body member having a first leg formed at one end thereof and a second leg formed at the opposite end thereof,

(b) said first leg having a first aperture defined therein and said second leg having a second aperture defined therein,

(c) said first aperture in said first leg adapted to be forced over a first projection on a bracket and said second aperture in said second leg adapted to be forced over a second projection on a bracket,

(d) a first flange formed at one lateral side of the body member and a second flange formed at the opposite side thereof, said flanges adapted to bear against a pair of idler rolls,

(e) the planar body of said keeper being interrupted by a plurality of openings,

(f) said keeper being executed in a malleable metal that takes a set and lacks any significant resilience characteristic,

2. said tool comprising:

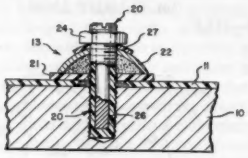
(a) an elongated handle that terminates in a cavity at its forward end,
(b) a lug joined to the handle,
(c) an L-shaped member including a horizontally extending arm and a vertically extending finger,
(d) a pin extending across said cavity and through said arm of the L-shaped member to secure one end of said member within the cavity of said handle,
(e) said handles and lug being rotatable relative to said pin,
(f) said finger being insertable into the openings in the planar body of the keeper so that said handle of the tool can be rotated to press the lug against each leg of said keeper until each aperture is forced over the projections on the bracket.

4,112,572

METHOD FOR REPAIRING PROTECTIVELY LINED REACTOR VESSELS

Seymour Schlosberg, East Brunswick, and Michael J. Lerman, Carteret, both of N.J., assignors to De Dietrich (USA), Inc., Union, N.J.

Division of Ser. No. 663,113, Mar. 2, 1976, Pat. No. 4,078,697. This application Aug. 1, 1977, Ser. No. 820,918
Int. Cl.[2] B22D *19/10*
U.S. Cl. 29—401 R **8 Claims**



1. A method for repairing a break in the lining of a protectively lined reactor vessel for containing conductive liquid and an object comprised of a first metal disposed in the liquid, the reactor vessel being of the type comprising a conductive metal support wall and an insulating protective inner liner, the method comprising the steps of:
producing an anchoring aperture in the portion of said metal support wall underlying said break; and
forming in said aperture a repair plug comprising a second metal galvanically dissimilar from said first metal by (a) anchoring an insulating stud into said anchoring aperture, (b) disposing a gasket on the portion of said protective lining surrounding said break, (c) applying a washer outside said sealing gasket, and (d) applying between said washer and said anchored stud a clamping pressure for clamping said gasket onto said protective lining throughout a periphery surrounding said break, thereby sealing said break.

4,112,573

METHOD OF FORMING AN ANIMAL-FIGURE DECORATION

Helen Ione Moye, P.O. Box 53, Wharton, N.J. 07885

Filed Sep. 21, 1977, Ser. No. 835,433
Int. Cl.[2] B21F *45/00*
U.S. Cl. 29—428 **10 Claims**

1. A method of forming an animal-figure decoration, such as a swan or the like, comprising the steps of:
providing a length of compliant wire rod;
forming a small loop at one end of said rod;
forming a plurality of ruches; and
forming annuli of said ruches; wherein
said ruches-plurality-forming step comprises forming said ruches of fabric strips of both discrete and common widths; and further including
enveloping said rod with said annuli in juxtaposition therealong; and wherein
said enveloping step comprises disposing said annuli in envelopment of said rod with (a) a first annular ruche formed of a first width disposed adjacent to said loop, (b) with a first plurality of second annular ruches all of which are formed of a second, common width disposed adjacent to said first annular ruche, (c) with a third annular ruche formed of a third width disposed adjacent to said first plurality of ruches, (d) with a second plurality of annular ruches formed of progressively increasing widths disposed adjacent to said third annular ruche, (e) with a third plurality of annular ruches formed of progressively increasing widths disposed adjacent to said second plurality of ruches, (f) with a fourth plurality of annular ruches

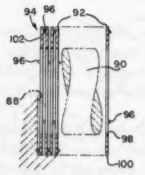
formed of progressively diminishing widths disposed adjacent to said third plurality of ruches, and (g) with a fifth plurality of annular ruches formed of progressively diminishing widths disposed adjacent to said fourth plurality of of ruches;
bending said rod to define a substantially elliptical and uniplanar loop of said second, third, fourth and fifth plurality of ruches;
bending said wire rod whereat said third annular ruche is disposed to dispose said first plurality of annular ruches substantially diagonal to, and partially overlying said elliptical loop, in a plane normal to said elliptical loop; and
bending said one end of said rod into a substantially U-shaped configuration, in said normal plane, with the terminal end of said rod disposed outward relative to said elliptical loop.

4,112,574

TORSIELASTIC THRUST BUSHING FOR TRACK CHAINS

Jack M. Deli, Wheaton, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Nov. 2, 1976, Ser. No. 737,967
Int. Cl.[2] B22D *11/126*; B21D *53/10*
U.S. Cl. 29—527.1 **6 Claims**



1. Method of construction of a unitary bushing laminated from alternating layers of disk metal, and of generally uniformly thin elastomer unitarily bonded to one another in aligned overlying relationship, with each such elastomer layer being of predetermined, substantially imcompressible thickness, comprising the steps of:
providing rings of protrusion spacers on the metal disks so as to protrude from their sides to an axial extent correspond-

ing to the predetermined thickness of the elastomer layers to be included;

stacking such disks in a mold with each in the stack separated to said axial extent from the next and with the end disks separated to said extend from the mold faces confronting the ends of the stack; and

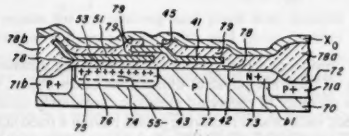
introducing into the mold a flowing elastomer mass filling the spaces due to said separation and bonding to the metal disks as included elastomeric layers therebetween.

4,112,575

FABRICATION METHODS FOR THE HIGH CAPACITY RAM CELL

Horng-sen Fu, Dallas; Thomas C. Holloway, Garland; Al F. Tasch, Jr., Richardson, and Pallab K. Chatterjee, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1976, Ser. No. 752,598
Int. Cl.[2] H01L *21/70*
U.S. Cl. 29—577 C **51 Claims**



1. A method of constructing an array capacity memory cells comprising the steps of:

(a) forming in a first surface of a semiconductor substrate, channel stop regions and overlying field insulator regions which are patterned to define a cell area for each cell of said array and several bit line areas which selectively interconnect said cell areas;

(b) introducing ions having majority carriers of a first conductivity type throughout said cell areas, thereby forming a shallow ion layer throughout each cell area;

(c) introducing ions having majority carriers of a second conductivity type throughout said cell areas at a level lying below said shallow ion layers, thereby forming a deep ion layer throughout each cell area;

(d) disposing a first insulating layer on said first surface overlying said cell areas;

(e) forming a patterned layer of conductive material on said insulating layer to define a storage gate region partially overlying each of said cell areas and spaced apart from said bit line areas;

(f) removing from each of said cell areas, the portions of said shallow ion layer lying between said storage gate regions and said bit line areas, and

(g) introducing ions having majority carriers of said first conductivity type, throughout the portion of each cell area lying between said storage gate regions and said bit line areas, at approximately the same depth and concentration as said deep ion layer lying therein.

4,112,576

METHOD OF MAKING A SWITCH

Harry Robert Gross, 127 Carpenter St., West Branch, Mich. 48661

Filed Nov. 17, 1975, Ser. No. 632,405
Int. Cl.[2] H01H *11/06*
U.S. Cl. 29—602 R **45 Claims**

1. In the manufacture of a switch having a plastic housing which contains a contact member movable to and from electrical contact with a surface of a terminal within the housing, the method of making the housing and terminal assembly which comprises,

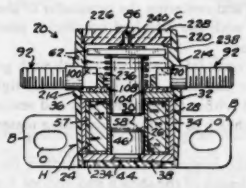
providing a set of dies cooperable in closed condition to define the configurations of the housing,

one of said dies having a face which conforms accurately to the contour of said terminal surface,

with said dies in open condition, positioning said terminal so that said surface is positioned for engagement against said face,

effecting relative closing movement of said dies and thereby causing said surface and face to advance toward each other in substantially the direction of relative movement of such contact member and surface for making electrical contact,

exerting force to cause said surface and face to interengage tightly,



injecting fluent plastic under pressure into the closed dies for forming said housing and causing portions of said plastic to encapsulate portions of said terminal,

during said injecting step utilizing said die face for accurately positioning said terminal surface in said direction relative to said housing,

said force and accuracy of contour being sufficient so that during said injecting step they are utilized to exclude said plastic substantially entirely from penetration between said surface and face,

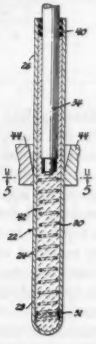
then after said plastic has set, opening said dies and removing the assembly of said formed housing and encapsulated terminal.

4,112,577

METHOD OF MAKING ELECTRIC HEATER

Gamdur S. Mann, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 10, 1978, Ser. No. 876,692
Int. Cl.[2] H05B *3/00*; F02P *19/00*
U.S. Cl. 29—611 **2 Claims**



1. The method of making an electric heater of the type having an elongated electrically conductive tubular metal sheath closed at one end and containing an axially extending heating coil electrically grounded at one end to the sheath adjacent its closed end and insulated therefrom elsewhere by

heat conductive insulation, said method comprising the steps of:

(a) forming the sheath with a width substantially larger than the desired finished size thereof,

(b) forming the heating coil in a width dimension smaller than the interior width of the sheath except at one end where a tightly wound portion is formed with an enlarged outer width dimension about equal to the sheath inner width dimension, the coil other end being attached to an electrical conductor,

(c) placing the heating coil and conductor in the sheath with the enlarged portion engaging the sheath adjacent to its closed end, the engaging surfaces of the sheath interior and the coil enlarged portion being free from foreign substances, and centering the remainder of the coil within the sheath with the attached conductor extending from the open end,

(d) filling the open interior of the sheath with granular high temperature electrical insulating material tightly packed around and within the heating coil and sealing the open end of the sheath to retain the insulating material in place, and

(e) swaging the heater assembly to reduce the width and extend the length of the sheath and interior heating coil to finished dimensions

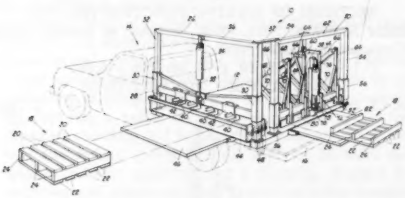
said sheath and said heating coil being formed of compatable metals whereby said swaging step causes the engaging portions of the sheath and heating coil to establish a low resistance electrical connection therebetween.

4,112,578

APPARATUS FOR DISASSEMBLING PALLETS

Dale J. Sanford, Anthony, Kans., assignor to Curfman, Brainerd, Harris, Bell, Weigans and Depew, Wichita, Kans.

Filed Jul. 8, 1977, Ser. No. 813,896
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—700 **8 Claims**



1. An apparatus for disassembling pallets, the apparatus mounted on the rear of a flat bed truck, a flat bed trailer, or the like, the pallet being a standard wooden pallet used with a fork lift and having parallel top boards and bottom boards nailed to lateral stringers therebetween, the apparatus comprising:

a vertical side frame mounted on the side of the flat bed;

means for removing the top boards of the pallet, said means for removing slidably mounted on said side frame, said means for removing receiving the top boards therein and raising the top boards upwardly thereby disengaging the top boards from the stringers;

a vertical rear frame mounted on the rear of the flat bed and disposed adjacent one end of said side frame; and

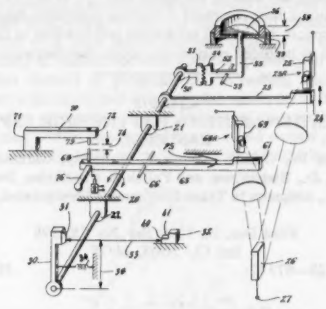
means for removing the lateral stringers of the pallet, said means for removing the lateral stringers clamping the stringers therebetween and raising the stringers upwardly thereby disengaging the stringers from the bottom boards of the pallet.

4,112,579

OPTO-MECHANICAL MEASURING SYSTEM

Morton Kaye, 122 Third St., Stamford, Conn. 06905

Filed Aug. 12, 1976, Ser. No. 713,701
Int. Cl.[2] G01B *5/02*
U.S. Cl. 33—174 L **7 Claims**



1. An opto-mechanical system for sequentially measuring a plurality of different physical dimensions of an object, comprising a plurality of receiving means for separately receiving said object, each of said receiving means having a fixed stop for engaging a first point of said object and a movable mechanical feeler positioned to engage a second point of said object in said receiving means, whereby the position of said feeler is related to the dimension of said object between said first and second points, a plurality of photodetectors arranged closely adjacent one another in a row, light source means for projecting at least one light beam toward said photodetectors, vane means between said light source means and photodetectors, lens means for imaging said vane means on said photodetectors, and means mechanically coupling said vane means to said feelers, whereby said vane means block said light in dependence upon said distance and the output of said photodetectors constitutes a digital representation of said distance, said light source means comprising first and second light sources for directing first and second light source beams toward said photodetectors, and said vane means comprises a first vane mounted to intercept said first light beam and a second vane mounted to intercept said second light beam, said first and second vanes being mechanically coupled to be movable by first and second of said movable mechanical feelers, whereby the same photodetectors are responsive to the positions of said first and second feelers.

4,112,580

DEVICE FOR DETERMINING ANGLES

William A. Fitzsimmons, 1015 Edgehill Dr., Madison, V.I. 53701, and James E. Lawler, Madison, Wis., assignors to William A. Fitzsimmons, Madison, Wis.

Filed Apr. 11, 1977, Ser. No. 786,646
Int. Cl.[2] G01B *3/56*
U.S. Cl. 33—174 S **9 Claims**

1. A device for determining angles, comprising:

(a) a support frame;

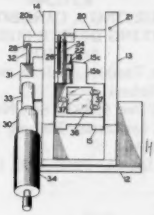
(b) a plate member having a planar surface;

(c) means for pivotally mounting said plate member to said frame for rotation of said plate member about a laterally extending axis of rotation;

(d) a pivot arm member;

(e) means for pivotally mounting said pivot arm member to said frame for rotation thereof about an axis of rotation which is perpendicular to the axis of rotation of said plate member, said pivot arm member being mounted in position to be engageable with said plate member over a selected portion of the rotational displacement of said plate member;

(f) drive means, mounted to said frame and including a drive member, for driving said drive member back and forth in a longitudinal direction perpendicular to the axis of rotation of said plate member and the axis of rotation of said pivot arm member, said drive means being mounted to said frame in position to have the drive member thereof engage said pivot arm member to rotate the same; and



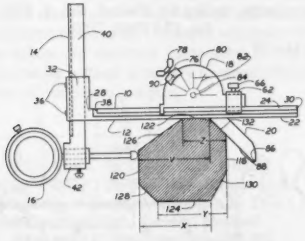
(g) means for maintaining said pivot arm member in low friction rolling contact with said plate member over a portion of the rotational displacement of said plate member such that a linear longitudinal displacement of said drive member in contact with said pivot arm member results in a related change in the angle at which the plane of the planar surface of said plate member intersects a plane which is parallel to the axes of rotation of said plate member and said pivot arm member.

4,112,581

MICROMETER JIG

Isaac W. Hornsby, 2706 Anza, Bakersfield, Calif. 93305

Filed Jun. 23, 1977, Ser. No. 809,386
Int. Cl.² G01B 5/00
U.S. Cl. 33—174 R **12 Claims**



9. A measurement jig comprising:

a frame having a planar work engaging surface;

a measurement indicator mounting means interconnected with said frame disposed to mount a measurement indicator with its axis parallel to, but laterally offset from, said frame work engaging surface; and

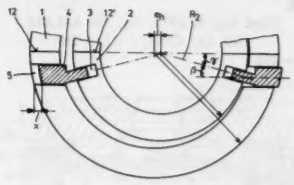
a movable member interconnected with said frame and having an elongated planar movable member work engaging surface forming a variable angle with said frame work engaging surface with its apex directed toward said measurement indicator work engaging surface.

4,112,582

APPARATUS FOR POSITIONING COAXIAL ARRANGED MACHINE PARTS

Wolfgang Beckershoff, Aarau, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 3, 1976, Ser. No. 682,633
Claims priority, application Switzerland, Jul. 4, 1975, 8731/75
Int. Cl.² G01B 5/25
U.S. Cl. 33—181 R **10 Claims**



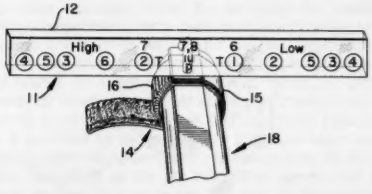
1. In an arrangement for positioning an inner circular machine part within an outer circular machine part, and wherein the inner circular part is desired to be adjustable within a first plane perpendicular to the longitudinal axis of the machine, the improvement wherein the outer periphery of said inner machine part is provided with radially extending recesses spaced around the periphery thereof, said recesses being located within the first vertical plane and extending symmetrically to a second vertical plane including the longitudinal axis of the machine, and the center lines of said radial recesses forming an angle γ with the horizontal axis of the inner machine part, said outer machine part being provided with circumferentially spaced non-radial recesses within the first vertical plane and located in alignment with said radial recesses, and angular positioning keys interconnecting each said radial recess with a non-radial recess, respectively, said keys being slidable in said recesses and the center line of the portion of each key engaging said radial recess forming an angle β with the center line of the portion of each key slidable within said non-radial recess whereby adjustment of said keys effects movement of one of said machine parts in said first vertical plane.

4,112,583

GUN LEAD SIGHT

Antonio Jose Castilla, 1804 Armstrong Dr., Plano, Tex. 75074

Filed Nov. 15, 1976, Ser. No. 741,674
Int. Cl.² F41G 1/00, 11/00
U.S. Cl. 33—261 **9 Claims**



1. In a lead sight for guns: a transparent elongate member having visually discernable numbers carried on the face thereof at respective transversely located positions, said numbers per se comprising respective front sight indicia usable for corresponding numbered shooting positions of a standard skeet range with predetermined ones of said numbers carried at first and second ones of said transversely located positions on respective opposite sides of the transverse center region of said elongate member for use with each of high-house and low-house released targets while at those predetermined shooting positions, mounting means for mounting said transparent elon-

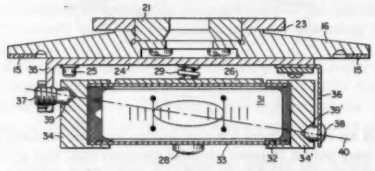
gate member on barrelling of a gun adjacent the muzzle end of the gun barrelling and wherein said mounting means includes flexible strapping having interlocking overlapping ends for inclosing and locking on the barrelling of guns.

4,112,584

TELESCOPE LEVEL ADJUSTING MEANS

J. Peter E. Kool, Succasunna, and Stephen Vagyoczky, Landing, both of N.J., assignors to Keuffel & Esser Company, Morristown, N.J.

Filed Sep. 9, 1977, Ser. No. 831,845
Int. Cl.² G01C *1/02, 9/28*
U.S. Cl. 33—292 **7 Claims**



4. In a geodetic instrument comprising an alidade, the improvement in telescope leveling means which comprises:

a. a base member mounted to one end of the axle of the telescope of said alidade and disposed substantially perpendicular to said axle;

b. a pair of flange members outstanding from said base member;

c. pivot means associated with each of said flange members;

d. a spirit level bubble vial; and

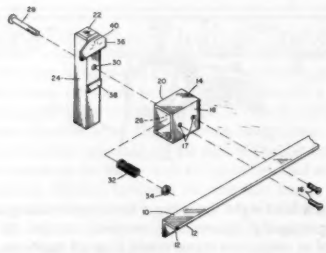
e. means mounting said vial longitudinally between said pivot means for rotation substantially about the longitudinal axis of said vial, said mounting means being so situated with respect to said vial axis as to establish an axis of vial rotation which is disposed at an angle to said vial axis, whereby rotation of said vial about said rotational vial axis will impart an angular displacement of the longitudinal axis with respect to the line of sight of said telescope.

4,112,585

LEVEL INDICATING INSTRUMENT

William Thomas Pease, Melbourne, Fla., assignor to Alproco, Inc., Melbourne, Fla.

Filed Feb. 7, 1977, Ser. No. 766,443
Int. Cl.² G01C *9/28*
U.S. Cl. 33—388 **9 Claims**



1. A level indicating instrument, comprising:

an angle bar having a pair of elongated members joined together along adjacent longitudinal edges and disposed in predetermined angular relationship,

a support base secured to said angle bar,

a mounting member rotatably connected to said support base,

level indicating means mounted on said mounting member, said mounting member having angle indicating means provided on a portion thereof disposed adjacent to said support base, and having spaced guide plates positioned to engage with opposite portions of said support base to releasably retain said mounting member and said support base in a predetermined angular relationship.

4,112,586

METHOD OF DRYING A CARDBOARD OR A PAPER WEB AND DRYING DEVICE FOR APPLYING THIS METHOD

Jukka A. Lehtinen, Tampere, Finland, assignor to Oy. Tampella AB, Tampere, Finland

Filed Dec. 9, 1976, Ser. No. 748,736
Claims priority, application Finland, Dec. 30, 1975, 753689; May 28, 1976, 761516
Int. Cl.² F26B *3/00, 13/26*
U.S. Cl. 34—9 **15 Claims**

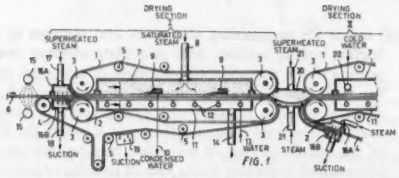


FIG. 1

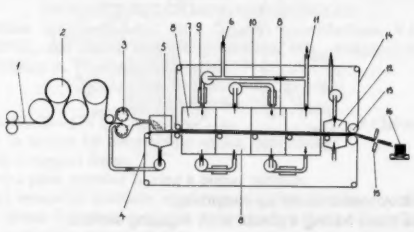
1. A method of drying a moving wet web of cardboard of paper comprising aupporting said web on a moving, drying band, contacting said web with a moving, heated drying surface in order to evaporate water from said web and into said drying band, and simultaneously contacting said drying band with a moving, cooling surface to condensed water received and contained by said drying band, removing the condensed water from said drying band and separating a dried web of cardboard or paper from the drying band.

4,112,587

METHOD AND MEANS FOR DRYING A FIBRE MATERIAL CONTAINING CELLULOSE

Frey Viking Sundman, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Finland

Filed Jan. 6, 1977, Ser. No. 757,351
Claims priority, application Finland, Feb. 9, 1976, 760294
Int. Cl.² F26B *7/00*
U.S. Cl. 34—12 **5 Claims**



1. A method for drying a fibre material containing cellulose, and preparing a coherent web therefrom which comprises (1) predrying the fibre material in the form of a web or flakes to a dryness of 60 to 70%, (2) disintegrating the pre-dried fibre material whereby a layer of fibres is formed from the disintegrated fibre material; (3) drying said fibre material by passing hot gases through the layer of fibres to a dryness of 90%; (4) cooling said dried fibre material by passing air through the

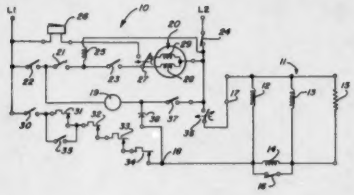
layer of fibres and (5) compressing the fibre layer to obtain a web.

4,112,588

DRIER APPLIANCE CONTROL

Roque Denis Marcade, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 17, 1977, Ser. No. 760,118
Int. Cl.[2] F26B *11/04*
U.S. Cl. 34—45 **8 Claims**



1. In a drier appliance having a heating means including an electrical component, thermostat switch means connected in series with said component for operating said heating means as an incident of the temperature sensed by said thermostat means being below a preselected temperature, a timer including a timer motor, a control switch connected in series with the motor for controlling operation of the timer, and means for electrically connecting the appliance to a power supply having a preselected voltage for effecting operation of the appliance, the improvement comprising a capacitor connected from between said timer motor and said control switch to between said thermostat means and said electrical component for connecting said timer motor in series with said electrical component through said capacitor when the control switch is open, said capacitor further connected between the timer motor and the thermostat switch means with said timer motor and said capacitor being effectively shorted by the thermostat switch means when the thermostat switch means is closed to energize said electrical component, said series arrangement of the timer motor, capacitor, and electrical component being connected to have the power supply voltage applied thereacross when the thermostat switch means and control switch are open, the capacitance of said capacitor being preselected to form with the inductance of said timer motor a series resonant circuit condition when said thermostat switch means and said control switch are open wherein the voltage across said timer motor is at least the minimum operating voltage of said timer motor and the voltage across the electrical component is less than the minimum operating voltage necessary to cause effective heating operation of said heating means.

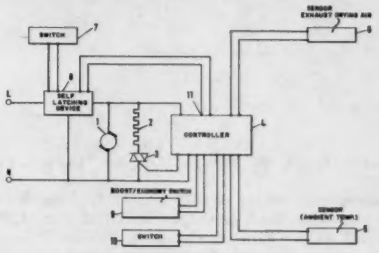
4,112,589

CONTROL SYSTEM FOR DRIER

Lesley Francis Palfrey, Havant, and Ronald John Fellows, Portsmouth, both of England, assignors to Thorn Domestic Appliances (Electrical) Ltd., London, England

Filed Sep. 27, 1976, Ser. No. 727,015
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—48 **8 Claims**

1. An air drier comprising: a housing; a chamber in the housing and in which, in use, articles are placed for drying; means for causing air to pass through the chamber; an inlet and an outlet for said air passing through said chamber; means for heating the air entering the chamber; and a controller for controlling the amount of heat supplied, during a drying cycle of the drier, to said incoming air by said heating means, the controller comprising first and second sensors for detecting the temperature of air leaving the chamber and the temperature of ambient air and a circuit for controlling said amount of heat in dependence on the detected difference in said temperatures,



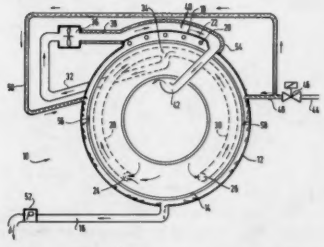
the circuit being effective to maintain said difference at a substantially constant value throughout the drying cycle.

4,112,590

COMBINED DRUM WASHER AND DRYING ARRANGEMENT

Franz Müller, Bad Honnef, Fed. Rep. of Germany, assignor to August Lepper, Maschinen- und Apparatebau GmbH, Bad Honnef, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 697,739, Jun. 18, 1976. This application Oct. 12, 1976, Ser. No. 731,818
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1975, 2545795; Jul. 2, 1975, 2529577
Int. Cl.[2] F26B *11/04*
U.S. Cl. 34—75 **30 Claims**



1. A device for both washing and drying laundry comprising: outer container means for enclosing the washing and drying compartment; inner container means forming the washing and drying chamber and for holding the laundry being treated, said inner container being rotatably mounted within and spaced from said outer container means; air circulation means for forming an air circulation path within said device and for circulating air through that circulation path such that air is provided to and withdrawn from said inner container; heating means adjacent the air circulation path for heating air being circulated in the air circulation means, said heating means positioned so as to heat air prior to the circulation of such air into said inner container means; cooling means for cooling air within said air circulation means, said cooling means positioned to cool air as the air is withdrawn from said inner container means; said cooling means including a first condensation means located in the space defined between said inner and outer container means, cooling medium supply means for supplying a cooling medium to said first condensation means; drain means for draining away the cooling medium and the condensation said drain means including the inlet to said air circulation means; said air circulation means including means for directing air withdrawn from said inner container

means through said first condensation means and thereafter out of said outer container through said drain means and into the inlet of said air circulation means.

4,112,591

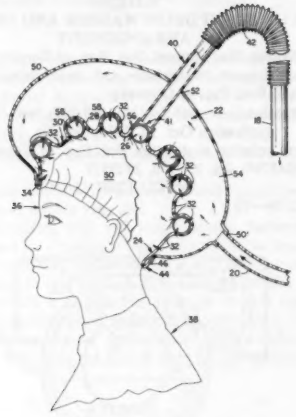
HAIR DRYER

Charles W. Marsh, 660 Miramar Ave., San Francisco, Calif. 94112

Continuation of Ser. No. 480,019, Jun. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 97,385, Dec. 11, 1970, abandoned, which is a continuation of Ser. No. 858,008, Sep. 15, 1969, abandoned, which is a continuation-in-part of Ser. No. 724,666, Mar. 27, 1968, abandoned, which is a continuation-in-part of Ser. No. 595,693, Nov. 21, 1966, abandoned. This application May 19, 1975, Ser. No. 579,013

Int. Cl.[2] A45D *20/18*

U.S. Cl. 34—99 **9 Claims**



1. Hair drying apparatus comprising: a pliable membrane having an inner hair-engaging surface and an outer surface; said membrane including a multiplicity of spaced perforations dispersed throughout the hair-engaging area of said membrane for communication between said inner and outer surfaces, said hair-engaging area being large enough to closely conform to a complex hair configuration on the user's head; and means for maintaining a pressure differential between said inner and outer surfaces comprising a peripheral head-gripping portion on said membrane, subambient pressure means outside of said membrane, and conduit means for providing communication of the subambient pressure with the inner surface of said membrane, said conduit means including multiple suction conduits, said conduit means communicating with the inner surface of said membrane through air inlet means comprising multiple air inlets, wherein there is sufficient pliability of the combined structure of said membrane and said conduit means to assure that all such air inlets, simultaneously, are positionable onto hair-wrapped curlers of random sizes wherein said hair-wrapped curlers are randomly positioned on the user's head, wherein said multiple suction conduits are flexible and communicate with the inner surface of said membrane, wherein such suction conduits are located away from the periphery of said membrane, and wherein all such suction conduits are joined directly to an intermediate conduit means located in spaced relation to said membrane.

4,112,592

APPARATUS FOR TEACHING OR PRACTISING BRIDGE

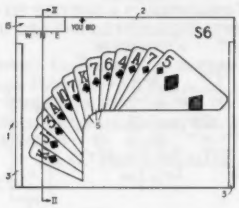
Arthur Jose De Castro Basto, Las Torres II, 3°B, Los Boliches Fuengirola, Spain

Filed Mar. 4, 1977, Ser. No. 774,400

Claims priority, application United Kingdom, Mar. 12, 1976, 9970/76

Int. Cl.[2] G09B *19/22*

U.S. Cl. 35—8 B **7 Claims**



1. An apparatus for teaching bridge comprising:

a first set of first sheets, each bearing a representation of the cards of a bridge hand, the cards being selected from a first predetermined group of cards;

a second set of first sheets, each bearing a representation of the cards of a bridge hand, the cards being selected from a second predetermined group of cards, the two groups of cards being mutually exclusive;

a first multiplicity of second sheets, each associated with a first sheet of the first set, each bearing information relating to one way of bidding the hand represented on its associated first sheet in a given situation and when the hand is in partnership with a hand represented on a first sheet of the second set, and each being moveable relative to its associated first sheet to reveal progressively different parts of the information on the second sheet; and

a second multiplicity of second sheets, each associated with a first sheet of the second set, each bearing information relating to one way of bidding the hand represented on its associated first sheet in a given situation and when the hand is in partnership with a hand represented on a first sheet of the first set, and each being moveable relative to its associated first sheet to reveal progressively different parts of the information on the second sheet.

4,112,593

APPARATUS FOR THE USE IN THE CONSTRUCTION OF ELECTRIC CIRCUITS

David Arthur Hill, and Abraham Lomnitzer, both of P.O. Box 10523, Johannesburg 2000, South Africa

Filed Sep. 7, 1977, Ser. No. 831,310

Int. Cl.[2] G09B *23/18*

U.S. Cl. 35—19 A **15 Claims**

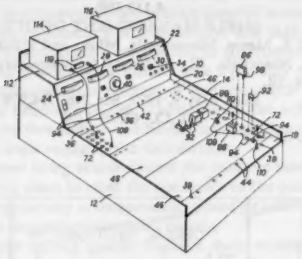
1. A circuit board comprising:

(a) a matrix member,

(b) a plurality of apertures in the matrix member,

(c) a plurality of cluster members one in each aperture and

each having a main prong receiving socket therein and at least one subsidiary socket, and



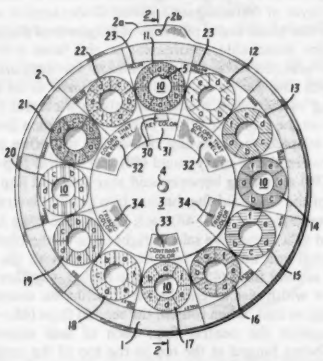
(d) engaging means on the board and the cluster members to prevent rotation of the cluster relative to the board.

4,112,594

COLOR COORDINATING IMPLEMENT

Leona R. Impastato, 27 Gray Rock La., Chappaqua, N.Y. 10514

Filed Apr. 28, 1977, Ser. No. 792,018
Int. Cl.² B44D *2/00*
U.S. Cl. 35—28.3 **5 Claims**



1. A color coordinating implement comprising a generally circular base member of stable sheet material having therein a series of openings arranged in a circular concentric with said base member, an annular band of color surrounding each of said openings, the colors of said color bands being selected in the manner that colors which blend well are disposed adjacent one another while contrasting colors are disposed at opposite sides of said base member, and an indicator member rotatably mounted on said base member concentric therewith, said indicator member being radially inside said circular series of openings and surrounding color bands, said indicator member having thereon indices to indicate key color, colors blending with said key color and contrasting color, whereby in use said implement is placed over a colored article and positioned so that said article shows through a selected one of said openings which is surrounded by a band having a color matching the color of said article and said indicator member is turned so that the key color index thereof is positioned adjacent said selected opening and associated color band whereupon said blending color indices indicate blending colors and said contrasting color index indicates contrasting color each of said annular color bands being divided into sectors each of a shade of the respective color of said band.

4,112,595

TEACHING DEVICES

Santiago Julio Fernandez, and Maria del Cármen Fernandez, both of Paseo & Portola, Palm Desert, Calif. 92260

Continuation-in-part of Ser. No. 623,320, Oct. 17, 1975. This application Jan. 24, 1977, Ser. No. 762,191
Int. Cl.² G09B *19/08*
U.S. Cl. 35—35 E **2 Claims**

¿CUÁL ES SU NOMBRE?
MI NOMBRE ES MARIA.
THE TUTOR SYSTEM
BOOK NO 2
1. Q. ¿CUÁL ES SU NOMBRE?
A. MI NOMBRE ES
3. Q. ¿CUÁNTOS AÑOS TIENE USTED?
A. YO TENGO . . . . AÑOS.
5. Q. ¿ESTUDIA USTED TODOS LOS DÍAS?
A. YO ESTUDIO TODOS LOS DÍAS.
NO, YO NO ESTUDIO TODOS LOS DÍAS.

1. A language teaching device to be used by a plurality of users comprising, in combination, at least two distinct and unique books, each of said books comprising a plurality of bound sheets and containing a selected number of unique questions in the given language followed respectively by a grammatical clue indicating the grammatical structure that should be used in answering the question, said questions being followed respectively by at least a portion of its model answer in the given language to be elicited by the user receiving the question; the totality of questions being constituted by a sequentially numbered set, the sequence alternating between the respective user's books, the questions of each book being so designed and coordinated as to simulate a conversation.

2. The method of teaching a given language or subject to a plurality of users comprising the steps of:

(a) providing each user with a distinct and unique book, wherein each book comprises a separate and distinct plurality of bound sheets and containing a selected number of question in the given language followed respectively by a grammatical clue indicating the grammatical structure that should be used in answering the question, said questions being followed respectively by at least a portion of a model answer in the given language, the totality of questions being constituted by a sequentially numbered set, the sequence alternating between the respective user's books, the questions of each book being so designed and coordinated as to simulate a conversation;

(b) commencing with the user having the book with question number one, said user asking said question and eliciting an answer in the given language by the recipient thereof which is intended to conform to the model answer appearing with said question, said user utilizing the grammatical clue to insure the grammatical correctness of the recipient's answer;

(c) proceding to the user having the book with question number two, said user asking said second question and eliciting an answer in the given language by the recipient thereof which is intended to conform to the model answer appearing with said second question, said user utilizing the grammatical clue to insure the grammatical correctness of the recipient's answer;

(d) continuing this alternating pattern throughout the set.

4,112,596
PSEUDO PALATE USEFUL FOR DIAGNOSIS AND TREATMENT OF SPEECH IMPAIRMENT

Samuel G. Fletcher, 2208 Avanti La., Birmingham, Ala. 35226, and Martin J. McCutcheon, 2313 Garland Dr., Birmingham, Ala. 35216

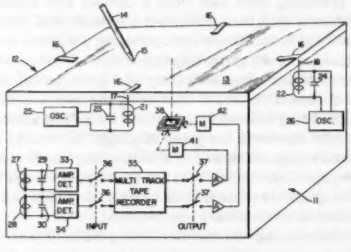
Filed Jan. 3, 1977, Ser. No. 756,070
Int. Cl.[2] G09B *19/04*
U.S. Cl. 35—35 R 5 Claims

1. A pseudo palate comprising:
(a) a sheet of electrically non-conducting material of from about 0.1 to about 0.5 mm thick and shaped to conform to the palate of a person,
(b) a plurality of electrodes on the lingual surface of the pseudo palate positioned in a predetermined pattern thereon, and
(c) a conductor for each electrode embedded in the sheet and exiting adjacent the rear portion of the pseudo palate, whereby through the use of other apparatus the type and extent of lingual contact may be determined.

4,112,597
APPARATUS FOR ENABLING THE MOTION OF A SCRIBER TO BE REPRODUCED

William H. Seaver, P. O. Box 86, New London, N.C. 28127

Filed May 16, 1977, Ser. No. 797,407
Int. Cl.[2] G09B *11/00*
U.S. Cl. 35—36 10 Claims

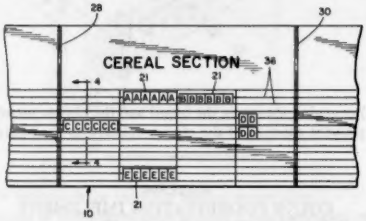


1. Apparatus for enabling the motion of a scriber to be reproduced comprising a body having a writing surface on which the scriber is adapted to be moved, radiator means coupled to the body, oscillator means for driving said radiator means so that the radiator emits waves that are replicas of waves derived by the oscillator means, receiver means for receiving waves transmitted by said radiator means, said body being formed of a material that does not perturb a characteristic of the transmitted and received waves, the scriber being formed of a material that perturbs the characteristic of the waves received by said receiver means, said radiator means being excited by the oscillator means and cooperating with the receiver means and scriber so that there is a unique relationship between each position of the scriber on the surface and the value of the characteristic received by said receiver means.

4,112,598
SHELF MANAGEMENT DEVICE

Edward A. Maass, Minneapolis, Minn., and William A. Stoneberg, Naperville, Ill., assignors to Magnecorp, Inc., Oak Brook, Ill.

Filed May 9, 1977, Ser. No. 794,978
Int. Cl.[2] G09B *1/08*
U.S. Cl. 35—53 1 Claim

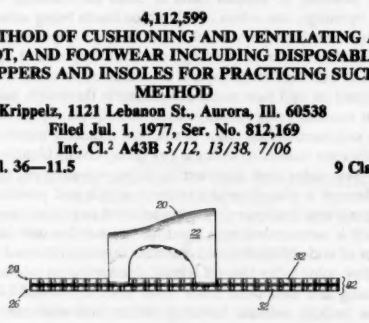


1. In combination with a shelf management device of the class which comprises a rigid primary panel (40) carrying a pair of rigid secondary panels, (24–26) each hinged to the primary panel at an upright edge thereof, each of said panels having a layer of ferromagnetic material coextensive with the surface of the panel and a plurality of magnetized plaques (21) adapted for detachable securement to the front side of the panels in selected arrangements, means for supporting the device with said panels co-planar and inclined to an ultimate supporting surface, said means comprising a central flap (42) mounted on the rear face of the primary panel on a horizontal axis and adapted to be swung outwardly to define an acute angle between the primary panel (40) and central flap (42), an element (50) extending between said rear face and flap to limit rotation of the flap, said flap having two parallel lateral edges, a pair of second flaps (45—45) each having one edge hingedly connected to a respective said upright edge of the central flap to be folded and unfolded into flat relation with the central flap, said second flaps (45—45), when folded, together having no greater widthwise extent than the widthwise extent of the central flap so that, when folded, the second flaps (45—45) will lie flat against the central flap, each of said second flaps (45—45) being hinged at the top to the top of the central flap (42) to enable a collapsed assembly no greater in thickness at its thickest part than the combined thickness of a second flap (45), the central flap (42) and the primary panel (40).

4,112,599
METHOD OF CUSHIONING AND VENTILATING A FOOT, AND FOOTWEAR INCLUDING DISPOSABLE SLIPPERS AND INSOLES FOR PRACTICING SUCH METHOD

Jacob Krippelz, 1121 Lebanon St., Aurora, Ill. 60538

Filed Jul. 1, 1977, Ser. No. 812,169
Int. Cl.[2] A43B *3/12, 13/38, 7/06*
U.S. Cl. 36—11.5 9 Claims



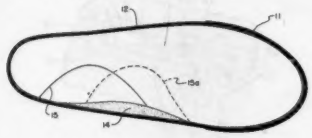
1. In the method of cushioning and ventilating a foot, the improvement which comprises placing

a cushioning and ventilating member against a foot surface;
the cushioning and ventilating member being of laminated construction consisting of a cushioning sheet and a web sheet both of non-rubberlike plastics material having flexibility, low resilience, low extensibility, and high tensile strength characteristics comparable to polyethylene;
the cushioning sheet being formed with a plurality of separate and independent pockets of uniform depth having sidewalls extending in one direction from the web sheet toward the foot surface and having substantially coplanar top end walls engaging the foot surface;
the web sheet being sealed against the concave side of the cushioning sheet to close the open ends of the pockets to provide a plurality of independent, closed air cells with air sealed at atmospheric pressure therein;
said air cells having spaces between them enabling free circulation of air in said spaces while the foot surface is engaged with the top end walls of the pockets;
the material of said cushioning sheet being sufficiently thin and flexible that the normal weight of a person applied to said cushioning and ventilating member through said foot surface causes said top end walls of said pockets to lend themselves fleixbly, conformably, and flatwise to said foot surface.

4,112,600
ORTHOPEDIC SHOES

George J. Hayward, 6285 Granada Dr., Salt Lake City, Utah 84121

Continuation-in-part of Ser. No. 633,275, Nov. 19, 1975, Pat. No. 3,997,984. This application Dec. 17, 1976, Ser. No. 751,263
The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.
Int. Cl.[2] A43B 7/22; A61F 5/14
U.S. Cl. 36—91 9 Claims



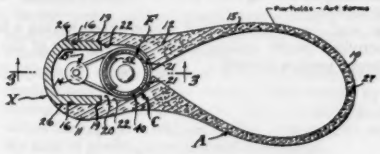
1. A flexible orthopedic sole having a medial wedge forming part of the lower surface in the heel portion thereof which gradually slopes laterally and forwardly to become integral with the normal sole surface, said sole being filled in and curving upwardly in the area of the plantar arch, terminating such that the medial side of the sole forms essentially a straight line extending from the heel of the sole to the portion of the sole adapted to accommodate the medial side of the ball of the foot, the upper surface of said sole containing a rim around the periphery thereof thereby forming an upper surface receptacle adapted to receive a shoe upper therein.

4,112,601
DYNAMICALLY ILLUMINATED FOOTWEAR

Gasper Chiaramonte, Jr., 229 Court Ave., Lyndhurst, N.J. 07071

Filed Mar. 23, 1977, Ser. No. 780,490
Int. Cl.[2] A43B 23/00; F21V 33/00
U.S. Cl. 36—137 6 Claims

1. In combination with a shoe platform having a riser comprised of a curvilinear perimeter wall of light transmitting material that conducts light within its solid substance and with a receptacle and an adjoining recess therein; a light modulator means comprising a power supplied body carried in the receptacle and a light source energized thereby with a color change means comprised of a series of color filters moveably disposed

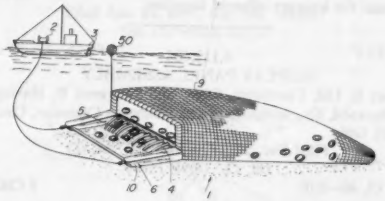


within said recess and means moving the same between the light source and light transmitting material of the riser.

4,112,602
APPARATUS FOR COLLECTING SHELLFISH AND THE LIKE

Hisao Kato, No. 37, 2-Chome, Showa-Machi, Nemuro City, Hokkaido, and Yohei Sakamoto, No. 1, 1-Chome, Hon-Cho, Nemuro City, Hokkaido, both of Japan

Filed Sep. 15, 1976, Ser. No. 723,470
Int. Cl.[2] A01K 75/00; E07F 5/00
U.S. Cl. 37—55 6 Claims



1. Apparatus for collecting shellfish and the like from the bed of a body of water comprising a frame including a pair of longitudinally extending parallel spaced runners and a bag net support member projecting upwardly from the rear ends of said runners, a bag net mounted on said support member adapted to receive and hold shellfish collected from the bed by a rake, a rake carried pivotably by and extending between said runners and comprising a pivot shaft having a plurality of substantially parallel spaced tines thereon, at least one of said runners having an upwardly extending columnar member with at least one aperture therein, said pivot shaft being journaled in said columnar member and having an adjusting arm secured to at least one end of said pivot shaft for rotation therewith, one end of said adjusting arm comprising an offset section in which a plurality of apertures are formed alignable with said at least one aperture in said columnar member, and fastening means for insertion through the aligned apertures of the corresponding columnar member and adjusting arm for fixing the shaft and the tines thereon in predetermined angular relation to the bed of the body of water.

4,112,603
LUGGAGE TAG

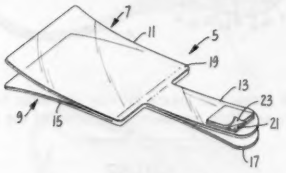
Joe D. Giulie, Palo Alto, Calif., assignor to General Binding Corporation, Northbrook, Ill.

Filed Mar. 14, 1977, Ser. No. 776,823
Int. Cl.[2] A44C 3/00
U.S. Cl. 40—2 R 3 Claims

1. A tag for luggage or the like comprising in combination:
a. a first sheet of a plastic material having an outer surface and inner surface and having an enlarged portion and a tongue extending therefrom;
b. a second sheet of substantially the same configuration;

c. said first and second sheets lying over each other with their inner surfaces together and being attached together adjacent the junction between the enlarged portion and the tongue, leaving most of the area of the enlarged portions free;

d. at least one of said first and second sheets having a heat-activated plastic coating on the inner surface of the enlarged portion thereof;



e. an area of pressure sensitive adhesive on the outer surface of said tongues, said pressure sensitive adhesive being protected by a layer of material which can be striped off of said pressure sensitive adhesive;

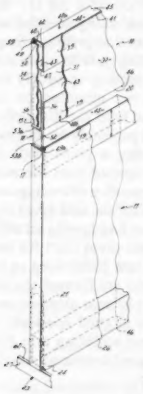
f. whereby one can place a card or the like between said first and second sheets and heat and press only the enlarged portions thereof leaving said tongues free and said protective layer removed from said pressure sensitive adhesive and the tongues adhered together.

4,112,604

DISPLAY PANEL ASSEMBLY

Robert B. Ott, Cincinnati, Ohio, and Lawrence R. Heringer, Edgewood, Ky., assignors to The Hennegan Company, Cincinnati, Ohio

Filed Dec. 27, 1976, Ser. No. 754,423
Int. Cl.[2] G09F *15/00*
U.S. Cl. 40—610 **8 Claims**



1. An improved display panel assembly comprising

(a) a hollow three-dimensional display panel comprising

a front display face wall, a rear display face wall, and two side walls connected between said display face walls,

a support member extending along and adjacent to each of the top and bottom edges of said display panel, at least one of said support members being tubular and having two spaced apart edge walls that each define at least one end edge, said two end edges thereby being spaced apart one from the other, said support members being erectable from a storage position where said face walls are collapsed one on top of the other to a use position where said face walls are spaced one from the other a distance generally equal to the width of said edge walls, and one side wall and said two end edges of said tubular member's edge walls cooperating to define a passageway for carrying a connector strip along the inside face of said side wall when said tubular support member is erected, and

slot and tab structure partially carried by said tubular support member and partially carried by a face wall of said display panel, said slot and tab structure cooperating to maintain said display panel in a three-dimensional erect attitude when said slot and tab structure is engaged and to permit said display panel to collapse into a storage attitude when said slot and tab strucure is disengaged, and

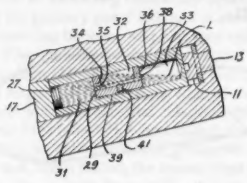
(b) a connector strip having a rigid tongue portion at one end thereof, said tongue portion having a cross-sectional configuration the same as the cross-sectional configuration of said passageway, said tongue portion being of cross-sectional dimensions substantially equal to but no greater than the cross-sectional dimensions of said display panel passageway, and said tongue portion being of a length greater than the length of said display panel passageway, the dimensions and cross-sectional configuration of said connector strip and said passageway, including said end edges of said tubular support member, cooperating to retain said connector strip in lateral position with said passageway.

4,112,605

GUN RECOIL REDUCER

John W. Staub, 261 Herbert, Alton, Ill. 62002

Filed Jun. 20, 1977, Ser. No. 807,912
Int. Cl.[2] F41C *27/00*
U.S. Cl. 42—1 V **10 Claims**



1. A device for reducing recoil in a shoulder-fired firearm comprising a cylinder arranged to be mounted in a direction in part axially of the firearm, partition structure within said cylinder intermediate the ends thereof and dividing said cylinder into a forward and a rear chamber, said partition structure being provided with restricted orifice means through it of substantially less area than the internal cross section of said cylinder, and liquid of high specific gravity partially filling said cylinder, whereby to react against said partition structure and the forward end of said cylinder during rearward movement of the firearm during recoil thereof, said reaction and the retardation caused by the restricted orifice means through said partition structure combining to retard rearward movement of the firearm due to recoil and thereby absorb a substantial portion of the recoil energy.

4,112,606

MUZZLE LOADING DEVICE

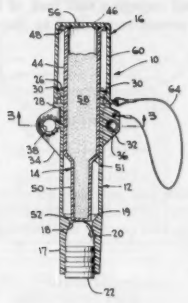
William Griffin, 224 N. Sunset Terr., Jackson, Miss. 39212

Filed May 12, 1977, Ser. No. 796,053
Int. Cl.[2] F41C *27/00*
U.S. Cl. 42—90 **17 Claims**

1. A muzzle-loading device for carrying materials for muzzle-loading firearms comprising

a tubular body having a first end adapted to hold a projectile and a second end;

an elongate container for holding powder having a closed end and an open end, said container having a portion including said closed end inserted in said tubular body; and



a cover extending over said open end of said container and removably secured to said second end of said body to seal said open end of said container and hold said container in said body.

4,112,607

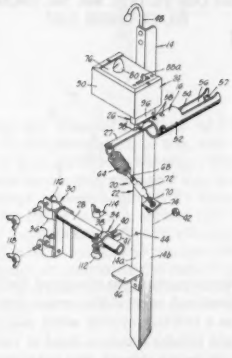
FISHING POLE HOLDING APPARATUS

Bernard B. Scher, 10702 Haddon, Pacoima, Calif. 91331

Filed Jan. 17, 1977, Ser. No. 759,821

Int. Cl.[2] A01K *97/12*

U.S. Cl. 43—17 **11 Claims**



1. An apparatus for holding a fishing rod and signaling a fish feeding on the bait comprising:

(a) a generally vertically disposed support member;

(b) a rod holding means pivotally connected to said support member for holding the fishing rod in a forwardly extending, cantilevered position, comprising:

(1) a first portion having a generally cylindrically shaped rod handle receiving portion and a forwardly extending open top rod handle cradle portion which is generally semi-circular in cross-section; and

(2) a second interconnected portion comprising an actuating lever extending rearwardly of said vertically disposed support member a substantial distance, said rod holding means being adapted for rotational movement about a transverse pivot axis located intermediate said first and second portions of said rod holding means whereby the weight of the rod will urge downward rotation of said first portion about said pivot axis and upward rotation of said actuating lever about said pivot axis against the counter balancing forces exerted by said actuating lever;

(c) biasing means acting between said actuating lever and said first support member for yieldably resisting upward rotation of said actuating lever;

(d) adjustment means associated with said biasing means for continuously adjusting the resisting force exerted by said biasing means whereby with the rod in operative position within the apparatus said rod holding means can be yieldably held in precise nonrotational equilibrium;

(e) signaling means mounted on said first support member for emitting visual and audible signals upon actuation thereof; and

(f) sensor means disposed intermediate said signaling means and said rearwardly extending actuating lever of said rod supporting means, said sensor means being operably associated with said signaling means and responsive to upward rotational movement of said actuating lever to actuate said signaling means.

4,112,608

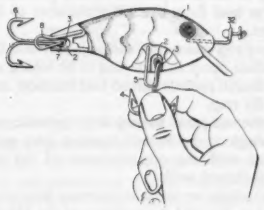
METHOD AND APPARATUS FOR FABRICATING FISHING LURES ETC.

Welbourne D. McGahee, 1896 Coolidge Ave., Melbourne, Fla. 32935

Filed Jan. 21, 1977, Ser. No. 760,927

Int. Cl.[2] A01K *85/00*

U.S. Cl. 43—42.09 **29 Claims**



1. A fishing lure, comprising:

a lure body; and

a hook hanger, comprising: a first bore penetrating the surface of said body; a second bore penetrating said body and an elongated retainer fabricated from a material having spring properties, said retainer including a secured end held rigidly within said body by the side walls of said second bore and a free end positioned adjacent to the wall of said first bore so that said elongated retainer descends into and crosses a majority of the diameter of said first bore.

4,112,609

PREFABRICATED DISPOSABLE FLY TRAP BLANK

Robert J. Kaveloski, 39663 Balboa, Sterling Heights, Mich. 48073

Filed May 12, 1977, Ser. No. 796,178

Int. Cl.[2] A01M *1/10*

U.S. Cl. 43—118 **10 Claims**

1. A prefabricated blank adapted to be folded into a disposable fly trap, said blank comprising

an elongated approximately T-shaped member of flexible sheet material including

a longitudinal end panel adapted to be folded at a first predetermined fold location into an arch-shaped inner wall of the fly trap and thereby to define an inner fly trap chamber,

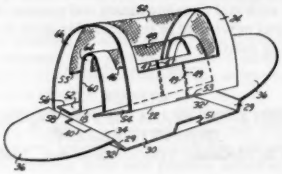
a bridge portion disposed adjacent said longitudinal end

panel and adapted to be folded relatively thereto at a second predetermined fold location,

a longitudinal intermediate panel disposed adjacent said bridge portion and adapted to be folded relatively thereto at a third predetermined fold location into an arch-shaped outer wall of the fly trap disposed in outwardly-spaced relationship to the arch-shaped inner wall thereof and to define therebetween an outer fly trap chamber,

each of said above-mentioned panels having therein a light-transmitting opening with a border portion adjacent thereto and a fly restraining network screen extending across said opening and having a peripheral portion overlapping said border portion and secured thereto,

each of said panels having border portion covering means movable into superimposed relationship with the re-



spective border portion thereof and also with the respective overlapping screen peripheral portion,

said longitudinal end panel having a fly exit port therein adapted in the arch-shaped folded positions of said panels to lead from the inner chamber to the outer chamber,

and a transverse end panel disposed adjacent said longitudinal intermediate panel and adapted to be folded relatively thereto at a fourth predetermined fold location into a floor wall of the fly trap,

said transverse end panel having at its opposite ends arch-shaped wings to be folded upward into end-closing relationship with the opposite ends of the inner and outer arch-shaped walls,

one of said wings having a fly entrance doorway therein adapted in the folded condition of the blank to lead from the exterior of the trap into the inner chamber thereof.

4,112,610

TOY GARAGE

Hiroshi Sano, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Mar. 11, 1977, Ser. No. 776,780

Claims priority, application Japan, Mar. 12, 1976, 51-30123; Apr. 6, 1976, 51-38931

Int. Cl.[2] A63H *33/00*

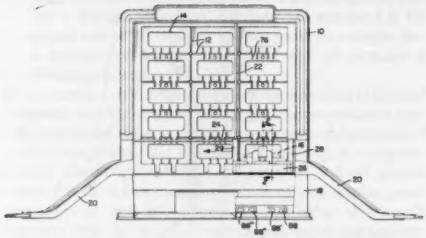
U.S. Cl. 46—12 **6 Claims**

1. An amusement device, comprising:

a cabinet provided with a plurality of openings therein,

a carrier, means mounting said carrier to move up and down with respect to said cabinet and from side to side with respect to said cabinet to align said carrier with a desired one of said openings of said cabinet including a first rod passing through an opening provided in said carrier and terminating in gear wheels at each end thereof, said cabinet being provided with two racks of teeth along which gears of said first rod move, a second rod passing through an opening provided in said carrier and termining in gear wheels at each end thereof, said cabinet being provided with two racks of teeth along which said gears of said second rod move, and

a control panel having first, second, third and fourth actuating members, and means operatively connecting said actuating members to said carrier to move said carrier up, down, left and right, respectively, including a first band provided with a continuous rack of teeth therein and attached to said first rod, a second band provided with a continuous rack of teeth therein and attached to said second rod, a first gear mounted to rotate and engaging said rack of teeth of said first band, a second gear mounted to rotate and engaging said rack of teeth of said second band, and means responsive to movement of said first



actuating member for rotating said first gear in one direction and responsive to movement of said second actuating member for rotating said first gear in the opposite direction, and means responsive to movement of said third actuating member for rotating said second gear in one direction and responsive to movement of said fourth actuating member for rotating said second gear in the opposite direction.

4,112,611

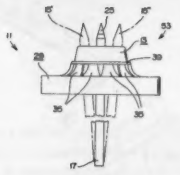
TWIRLING TOY DEVICE

Samuel H. Kernell, 1052 Railton, Memphis, Tenn. 38111

Filed Oct. 18, 1976, Ser. No. 734,541

Int. Cl.[2] A63H *1/32*

U.S. Cl. 46—47 **16 Claims**



1. A toy device comprising an elongated rod having a distal end and a proximal end, and tubular means for encircling said elongated rod in a twirling motion when said rod is manipulated to cause said tubular means to twirl at various selectable locations along the length thereof, said rod having a substantial cylindrical shape thereto, and said rod being unobstructed at the distal end thereof for movement of said tubular means onto and off of said distal end, said tubular means having first and second remotely disposed open ends and having a substantially unobstructed interior for allowing said elongated rod to selectively extend completely therethrough.

4,112,612

CONVERTIBLE AERIAL PROJECTILE TOY

William W. Woods, 901 Grayland St., Greensboro, N.C. 27408

Filed Feb. 22, 1977, Ser. No. 770,599

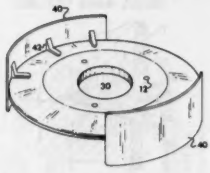
Int. Cl.[2] A63H *27/00*

U.S. Cl. 46—74 D **9 Claims**

1. An aerial projectile toy comprising:

(a) a substantially circular disc formed of a self-supporting, relatively soft, lightweight, moldable material;

(b) a plurality of flight altering structures, each of which, when attached to said disc, provides predictable aerodynamic characteristics of the air flow path around and over said disc during flight which differ from such characteristics achieved with the other of said structures;

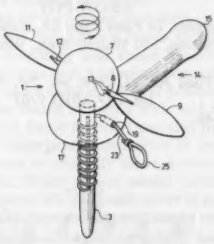


(c) cooperative means on said disc and said flight altering structures for releasably temporarily securing selected ones of said structures at a time to said disc.

4,112,613
SPINNING TOY

Steve Toplak, 14 Islay Ct., Weston, Ontario, Canada (M9M 1V3)

Filed Jun. 2, 1977, Ser. No. 802,622
Int. Cl.[2] A63H *27/00*
U.S. Cl. 46—83 **4 Claims**



1. A spinning toy adapted for flight and for subsequent spinning on a landing surface as a top; said toy having an elongated lower stem portion for winding a string therearound which upon rapid unwinding, spins said toy; an enlarged upper portion and wings extending outwardly from said enlarged upper portion for flying said toy; each of said wings comprising a blade and a cylindrical shaft; said enlarged upper portion being provided with a cylindrical passage within which the shafts of said wings are journaled; the ends of said shafts being interconnected by a gear arrangement so that said wings are manually adjustable to vary the flight time to surface spinning time of said toy.

4,112,614
REINFORCED ARTICLES OF ELASTOMERIC MATERIAL

Arthur C. Clokey, c/o Prema Toy Co., P.O. Box 707, Topanga, Calif. 90290

Filed Apr. 7, 1977, Ser. No. 785,488
Int. Cl.[2] A63H *3/04*
U.S. Cl. 46—151 **9 Claims**

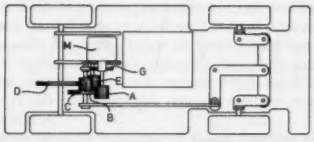
1. An article of elastomeric material having a facial portion in the form of a facial likeness or a caricature capable of assuming a variety of different facial expressions, said article having deformable reinforcement embedded in the elastomeric material and said facial portion and said reinforcement being capable of being manually manipulated and said reinforcement holding the elastomeric material in the selected facial expression, said reinforcement comprising a first reinforcing member extending substantially around the periphery of the facial portion of the article and a second reinforcing member extending transversely across the facial portion of the article, said

second reinforcing member being affixed to said first reinforcing member.

4,112,615
REMOTE CONTROL SYSTEM FOR A MOVABLE TOY VEHICLE

Zenichi Ishimoto, Tokyo, Japan, assignor to Nikko Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1976, Ser. No. 727,622
Int. Cl.[2] A63H *29/18, 30/00*
U.S. Cl. 46—254 **3 Claims**



1. A remote control system for a travelling toy vehicle comprising a transmitter unit including a high frequency generating means for a carrier signal of specific predetermined frequency, and a receiving unit including a super regenerative detection circuit for receiving said signal and for normally generating an amplifiable noise signal, said receiving unit serving to attenuate said noise signal when receiving said carrier signal, a relay having a two-position switch normally retained in a first position when energized by the amplified noise signal and movable to a second position when the noise signal is attenuated by the transmission of the carrier signal, a motor for driving said vehicle and a battery-operated control circuit including the switch of said relay to selectively operate the motor in opposite directions.

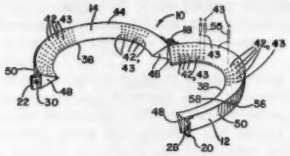
4,112,616
METHOD AND APPARATUS FOR SELECTIVELY PREVENTING OR PERMITTING SAP FLOW TO CONTROL BUD FORMATION

Bobbie O. Savage, P.O. Box 2434, Farmington, N. Mex. 87401

Continuation-in-part of Ser. No. 823,473, Aug. 10, 1977. This application Dec. 12, 1977, Ser. No. 860,022
Int. Cl.[2] A01G *15/00*
U.S. Cl. 47—1 R **4 Claims**

1. Apparatus for preventing premature bud formation comprising at least two arcuate units adapted to be interposed in a generally horizontal section cut around the periphery of a tree and into an area around the outer edge of heartwood of the tree, each of said units including perforated means permitting sap-flow communication between sap-carrying cells if desired and means which may be selectively conditioned to block perforations of said perforated means to prevent sap-flow communication or to be clear of the perforations of said perfo-

rated means to permit sap-flow communication between sap-carrying cells through said perforated means, said perforated means having wick means in perforations thereof wherein some of said wick means will be out of alignment with others



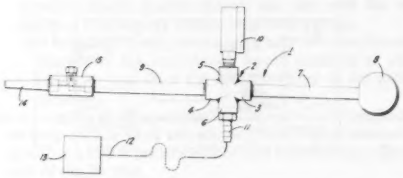
of said wick means when said perforated means are conditioned to prevent sap-flow and wherein all of said wick means are in alignment with others of said wick means is conditioned for sap-flow communication.

4,112,617

DEVICE FOR INJECTING A LIQUID INTO THE TRUNK OF A TREE

Billy Joe Purviance, 3737 N. Duncan Rd., Linden, Calif. 95236

Filed Apr. 1, 1977, Ser. No. 783,705
Int. Cl.[2] A01G *29/00*
U.S. Cl. 47—57.5 **1 Claim**



1. A device, for pressure injecting a tree-treating liquid solution into the trunk of a tree, comprising a central fitting of cross-type including front, rear, top, and bottom necks, the front neck being in communication with the top and bottom mecks, a rigid tube secured to and projecting forwardly from the front neck, an elongated, tapered nozzle fixed in communication with and projecting axially forward from the front end of the tube, a one-way check valve associated with the tube and opening in the direction of the nozzle, a rigid rod secured to and projecting rearwardly from the rear neck, a manual thrust member mounted on the rear end of the rod, the nozzle being adapted to be jam-fitted in a bore in the tree by hand-thrusting of said member, a hose-connection stem secured to and depending from the bottom neck, a flexible hose coupled to said stem, the hose being adapted to pressure-feed a metered quantity of the tree-treating solution through said stem, central fitting, tube, and nozzle when the latter is so jam-fitted in a bore in the tree, and a pressure gauge connected to and upstanding from the top neck.

4,112,618

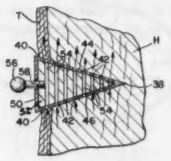
METHOD AND APPARATUS FOR SELECTIVELY PREVENTING OR PERMITTING SYSTEMIC SAP FLOW TO CONTROL BUD FORMATION

Bobbie O. Savage, P.O. Box 2434, Farmington, N. Mex. 87401

Filed Aug. 10, 1977, Ser. No. 823,473
Int. Cl.[2] A01G *15/00*
U.S. Cl. 47—58 **12 Claims**

1. Method for preventing premature bud formation in a tree when its dormancy is interrupted by unseasonably warm weather which would promote flow of tree sap and consequently premature formation of buds which upon resumption of cold weather would be subjected to kill back and result in severe damage to the tree, wherein said method comprises the steps of:

(a) cutting all around and through the bark and sap-carrying cells of a tree to the outer edge around the tree's heartwood;



(b) interposing means within the area between the cut portions of sap-carrying cells which may be selectively conditioned to prevent or permit sap-flow communication between the remains of the cut portions of sap-carrying cells; and

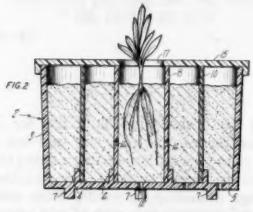
(c) sealing the periphery of the tree in the area around the cut with grafting tar to inhibit loss of sap.

4,112,619

GROW-POT

Rosemary Morsani, 14 Palm Point Dr., Jupiter, Fla. 33458, and Edwin G. Nelson, 310 Walton Blvd., West Palm Beach, Fla. 33405

Filed Jul. 12, 1976, Ser. No. 704,643
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—66 **13 Claims**

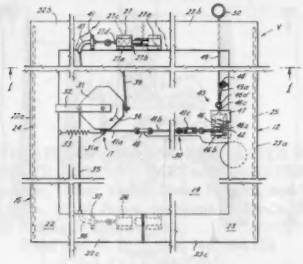


1. A grow-pot for growing plants comprising an outer pot having a first side wall with a bottom wall for containing the roots of a plant in a growing mixture, a tubular member having a second side wall with a top end and a bottom end, said second side wall being open at each end, said bottom end having no bottom wall, guide means on said bottom wall of said outer pot, said second side wall being smaller than said first side wall to be positioned in said outer pot with said bottom open end of said second side wall positioned in said guide means on the bottom wall, said guide means being spaced inwardly from the first side wall of said outer pot with said second side wall providing a smaller sized pot within said outer pot for initially containing the roots of a plant in a growing mixture during its early growth, said second side wall comprising a plurality of lengthwise segments for ease of removal from a growing mixture, said lengthwise segments having top and bottom ends, said guide means on said bottom wall of said outer pot for locating and supporting the bottom ends of said lengthwise segments of said second side wall at its position spaced inwardly from the first side wall, said lengthwise segments being longitudinally slideable with respect to each other when supported by said guide means.

4,112,620
SMOKE AND HEAT VENT

Kiyoshi Sandow, Baytown, Tex., assignor to Plasteco, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 647,368, Jan. 8, 1976, abandoned. This application Mar. 10, 1977, Ser. No. 776,237
Int. Cl.² E05F *15/20*
U.S. Cl. 49—8 **16 Claims**



1. A new and improved heat and smoke vent adapted to be mounted with an opening in the roof of a building or the like, comprising:

a cover-supporting frame assembly having an opening therein and being adapted for mounting over an opening in the roof of a building or the like;

a cover positioned on said frame assembly;

said frame assembly including a frame section and frame mount means mounting said frame section for pivotal movement between a first, horizontal position for supporting said cover and a second, vertical position;

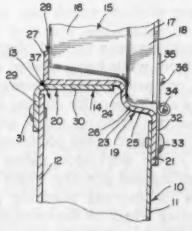
emergency release means mounted with said frame section for releasing said frame section from said first horizontal position under emergency conditions in order to allow said frame section to pivotally move downwardly; and

said frame section, frame mount means, cover and emergency release means allowing said cover to fall away from said frame section for releasing said cover only for falling movement downwardly at least partially out of said roof opening in response to pivotal movement downwardly of said frame section in order to allow heat and smoke to pass out of such building.

4,112,621
ADJUSTABLE THICKNESS VENT DOOR ASSEMBLY FOR CARGO BODIES

Leonard M. Ehrhart, Country Club Hills; John R. Pratte, Naperville, and Paul E. Mazik, Jr., Chicago, all of Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed May 27, 1977, Ser. No. 801,199
Int. Cl.² E05D *7/00*
U.S. Cl. 49—400 **1 Claim**



1. In a cargo transporting body having a wall construction including an opening, said wall construction including parallel opposite wall sides having a certain cross-sectional dimension, the improvement of a door and frame assembly for said opening, said arrangement being adapted for assembly with walls of different cross-sectional dimensions, comprising:

a door of relatively constant thickness dimensions having first and second parallel door side walls,

a door frame extending about said door including a first angle shaped frame part having a first flange extending outwardly of said door being substantially flush with a first door side wall,

means hingedly connecting said first flange to said first door side wall,

a second flange extending perpendicular to and connected to said first flange,

said second flange extending toward said second door side,

a third flange connected to said second flange and extending in a direction inwardly toward and overlapping said second door side,

a second angle shaped frame part having a fourth flange extending in the direction of said first flange,

a fifth flange connected to said fourth flange extending perpendicular to said fourth flange and overlapping said second flange,

means connecting said first and fourth flanges respectively to said opposite wall sides in overlapping relation,

means interconnecting said second and fifth overlapping flanges,

said body wall construction including panel type walls,

said third flange having a continous edge portion forming a second opening defined by said door frame,

said door including a base portion in a closed position engaging said third flange to block said second opening,

an outwardly projecting ledge portion on said base,

an offset corner portion connecting said first and second flanges, providing a recess on said frame for seating said ledge in substantially flush relation relative to said wall construction,

said corner portion including a flange portion extending laterally with respect to said second flange,

a second flange portion extending laterally with respect to said first flange,

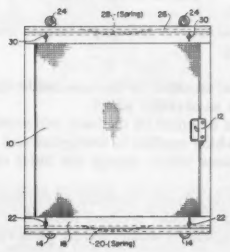
an arcuate flange portion connecting said first and second flange portions, and

said hinge means having a hinge axis substantially in lateral alignment with said second flange portion in opposing relation to said arcuate flange portion.

4,112,622
ROLLER ASSEMBLY FOR SLIDING SCREEN DOOR, AND THE LIKE

David E. Stewart, Los Angeles, Calif., assignor to Empire Metal Products Corp., Los Angeles, Calif.

Filed Sep. 7, 1976, Ser. No. 720,888
Int. Cl.² E05D *13/02, 15/16*
U.S. Cl. 49—421 **6 Claims**



1. In combination: a roller assembly and a sliding screen

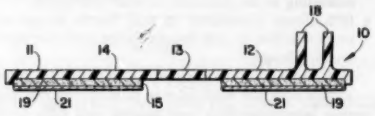
door, said door having a channel in the edge thereof, and an opening in the channel for receiving the roller assembly, said roller assembly comprising: an open-ended, open-topped housing having a pair of parallel sides adapted to fit into said opening and having integral lugs formed on said sides adjacent the upper edges thereof and adapted to extend beyond the edges of said opening to enable the housing to be suspended into said opening; and a roller mounted in said housing for rotation about an axis extending transversely with respect to said housing.

4,112,623

MEETING RAIL FOR SLIDING WINDOWS

Neil Soden McPherson, 1162 W. 26 Ave., Vancouver, B.C., Canada (V6H 2A7)

Filed Sep. 12, 1977, Ser. No. 832,158
Int. Cl.² E06B 7/22
U.S. Cl. 49—488 **1 Claim**



1. A meeting rail assembly for application to over-lapping marginal edge portions of closable sliding window panes comprising:

(a) a pair of meeting rails, one for each window,

(b) each meeting rail comprising:

(i) a pair of parallel planar strips of semi-rigid thermoplastic material having inner and outer side surfaces,

(ii) a connecting strip of flexible thermoplastic material extending parallel to and positioned between and fused at its edges to adjacent edges of the semi-rigid strips,

(iii) a plurality of parallel, longitudinally extending spaced-apart ribs disposed on the outer side surface of one of the semi-rigid strips of each rail, said ribs being of a flexible thermoplastic material and being fused to said one semi-rigid strip,

(iv) a pressure sensitive adhesive on the inner surfaces of the semi-rigid strips for enabling the meeting rails to be applied and secured to said marginal edge portions of the panes in a position in which the ribs of opposing rails extend in inter-digital relationship when the panes are closed.

4,112,624

GRINDING MACHINE

Herbert R. Uhtenwoldt, and Norman S. Humes, both of Worcester, Mass., assignors to Cincinnati Milacron-Heald Corp., Worcester, Mass.

Continuation of Ser. No. 651,434, Jan. 22, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,268
Int. Cl.² B24B 53/14
U.S. Cl. 51—5 D **12 Claims**

7. Grinding machine for finishing a bore in a tubular workpiece, comprising:

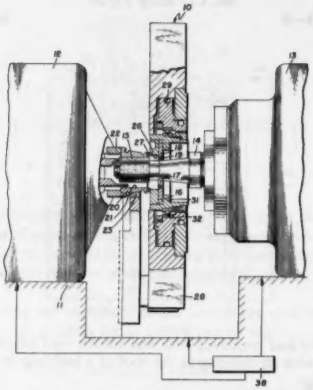
(a) a base,

(b) a wheelhead mounted on the base and having a rotatable spindle with an abrasive wheel,

(c) a workhead mounted on the base, said workhead including means which engages to workpiece and rotates it and including shoes which engage the outer surface of the workpiece,

(d) a support body fixedly mounted on the base, the support body having a circular aperture through which the abrasive wheel advances axially during parts of the grinding cycle,

(e) a dressing wheel in the form of a rigid annulus mounted on the support body with its inner dressing surface protruding into the aperture and located in a general plane extending transversely of the spindle axis, the inner dressing surface of the annulus having a diameter substantially larger than the external diameter of the abrasive wheel, the dressing wheel being mounted in bearings in the support body aperture for rotation independently of the wheelhead about the major axis of the annulus, and



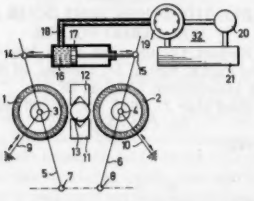
(f) feed means producing relative movement between the wheelhead and the dressing wheel to bring about dressing engagement between the said inner surface of the dressing wheel and the said external surface of the abrasive wheel.

4,112,625

DEVICE FOR GRINDING ELONGATED CYLINDRICAL WORKPIECES

Walter Wetzels, Eynatten, Belgium, assignor to SCHUMAG Schumacher Metallwerke Geselischaft mit beschänkter Haftung, Aachen, Germany

Division of Ser. No. 713,571, Aug. 11, 1976, Pat. No. 4,063,906. This application Mar. 25, 1977, Ser. No. 781,191
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1975, 2537151
Int. Cl.² B24B 7/02, 7/12
U.S. Cl. 51—33 W **3 Claims**



1. Device for carrying out a method of grinding elongated, cylindrical workpieces while being rotated about the longitudinal axes thereof, comprising guide means extending in longitudinal direction of a workpiece for guiding and supporting the workpiece, at least one grinding wheel adjacent said guide means and operable so as to apply prestressing grinding pressure transversely to the workpiece, means for mechanically supporting and feeding said grinding wheel toward the workpiece, and means for exerting pulsating grinding pressure through said grinding wheel on the workpiece, the pulsating grinding pressure having a frequency that is outside the frequency ranges of resonant vibrations of the workpiece and the device, and including an hydraulic cylinder connected to said mechanical supporting and feeding means for said grinding

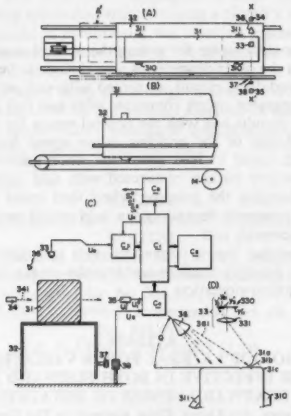
wheel, said means for exerting pulsating grinding pressure including a device for generating pulsations in the hydraulic cylinder, said device for generating pulsations comprising a rotary piston valve, a pump, and a pressure fluid tank, respectively connected to one another.

4,112,626

AUTOMATIC DESEAMING APPARATUS FOR ELONGATE BLOCK OF METALLIC MATERIAL

Kazuo Watanabe, Ohbu; Toshio Endo, Nagoya, and Katsuhiro Kojima, Chita, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 8, 1977, Ser. No. 786,114
Int. Cl.[2] B24B 7/02
U.S. Cl. 51—35 4 Claims



1. An automatic deseaming apparatus for removing defects from an elongate block of metallic material comprising:

a defect marking detector for detecting defect markings applied to defects on the surface of said block, said defect markings consisting of a material containing a flourescent pigment;

a defect marking position detector;

a grinding controller responsive to said defect marking detector and said defect marking position detector for formulating first data representative of the positions of portions of said detected defect markings;

a memory for storing said first data representative of said detected defect markings, said grinding controller being further responsive to compile from said stored first data second data representative of the positions of each entire marked defect and for formulating grinding sequence data from said compiled second data, said sequence data enabling a grinding wheel to successively move to all marked defects in a minimum of time; and,

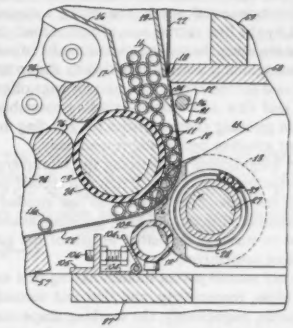
a grinding wheel for reciprocally grinding each said defect in the direction of the longitudinal axis of said block, said grinding wheel being responsive to said grinding sequence formulated by said grinding controller.

4,112,627

GLASS CYLINDER SUBDIVIDING APPARATUS AND METHOD

Hendrik de Kanter, Santa Ana, Calif., assignor to DKA, Inc., Marina Del Rey, Calif.

Filed Apr. 20, 1977, Ser. No. 789,338
Int. Cl.[2] B24B 1/00, 5/50
U.S. Cl. 51—79 55 Claims



55. A method of fully separating cylindrical glass tubes into predetermined discrete shorter tubes, which comprises:

(a) effecting sequential rolling of a multiplicity of parallel cylindrical glass tubes along a support, and

(b) effecting, when each such tube reaches a predetermined station, simultaneous full separation of such tube into at least several discrete shorter component tubes,

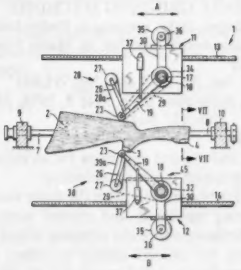
said separations being so performed that the end faces of said component tubes are substantially perpendicular to their axes.

4,112,628

DUPLICATING GRINDING MACHINE

Erich Schmidt, Maversbach, Austria, assignor to Maschinenfabrik Zuckermann Komm. Ges., Vienna, Austria

Filed Apr. 5, 1977, Ser. No. 784,725
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1976, 2614843
Int. Cl.[2] B24B 21/04, 17/02
U.S. Cl. 51—140 9 Claims



1. A duplicating grinding machine for grinding irregularly shaped three-dimensional workpieces consisting of at least two materials having different grinding properties comprising:

a pattern including first and second partial models,

means for mounting said pattern and a workpiece in spaced parallel relation one to the other,

means for rotating said pattern and the workpiece about parallel longitudinal axes,

a first carrier arm unit including first and second carrier arms interconnected one with the other, a scanning roller carried by said first carrier arm for scanning the first partial model of said pattern,

a first grinding assembly carried by the second carrier arm for engaging the workpiece,

a second carrier arm unit including first and second carrier arms interconnected one to the other, a scanning roller carried by the first carrier arm of said second carrier arm unit for scanning the second partial model of said pattern, a second grinding assembly carried by the second carrier arm of said second carrier arm unit for engaging the workpiece, said first and second grinding assemblies having different grinding characteristics for grinding materials of different grinding properties, respectively,

means for longitudinally displacing the workpiece and pattern on the one hand and said first and second carrier arm units on the other hand relative to one another whereby said scanning rollers and said grinding assemblies are adapted to traverse the entire length of the pattern and workpiece respectively,

said first and second partial models having first and second raised areas, respectively, and first and second working shape areas, respectively, the working shape area of each partial model being complementary to the raised area of the other partial model, and also associated with grinding a predetermined area of like material of the workpiece, the scanning roller of said first carrier arm of said first carrier arm unit enabling said first grinding assembly to engage the workpiece when scanning said first working shape area of said first partial model to shape the workpiece in accordance therewith and to disengage from said workpiece when scanning said raised area of said first partial model, the scanning roller of said first carrier arm of said second carrier arm unit enabling said second grinding assembly to engage the workpiece when scanning said second working shape area of said second partial model to shape the workpiece in accordance therewith and to disengage from the workpiece when scanning said raised area of said second partial model, whereby said grinding assemblies selectively grind the different materials of the workpiece respectively at different locations therealong in accordance with the pattern and during a single relative longitudinal displacement of the workpiece and pattern on the one hand and the carrier units on the other hand.

4,112,629

MEASURING AND CONTROL APPARATUS FOR INTERNAL GRINDING MACHINES

Mario Possati, Bologna, Italy, assignor to Finike Italiana Marposs Soc. in Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

Filed Apr. 28, 1977, Ser. No. 791,881
Claims priority, application Italy, May 5, 1976, 3418 A/76
Int. Cl.[2] B24B *49/04*
U.S. Cl. 51—165.93 **6 Claims**

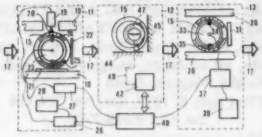
1. A measuring and control apparatus for an internal grinding machine, the grinding machine including:

resting devices for cooperating with the outer surface of the workpiece being machined; and control means for controlling the displacement of the grinding wheel relative to the workpiece, the control means including measuring means for providing a signal responsive to said displacement; the apparatus comprising:

a measuring machine arranged upstream of the grinding machine for subsequently receiving and measuring the workpieces to be machined in the grinding machine, the measuring machine including a first gauge generating a signal responsive to the diameter of the outer surface of the subsequent workpieces; a second gauge generating a signal responsive to the diameter of the internal surfaces of the workpieces; and an ejection device;

transfer means for transferring in succession workpieces from the measuring machine to the grinding machine and away from the grinding machine;

processing means connected with said measuring machine, transfer means and control means for controlling their operation, the processing means including: comparison circuits connected with said first and second gauges and with said ejection device for controlling the ejection of scrap workpieces and that of workpieces having diameters which would render unsafe the machining operation; a first delay circuit connected with said first gauge and with



said control means for setting the control means depending on the outer diameter of a workpiece to be machined; a second delay circuit connected with said second gauge; a comparator circuit connected with said first and second delay circuits and with the control means for controlling the change of the grinding wheel speed from fast approach speed to feed speed for stock removal; further comparator circuits connected with said control means for changing the grinding wheel feed speed during the stock removal depending on said signal responsive to displacement; and

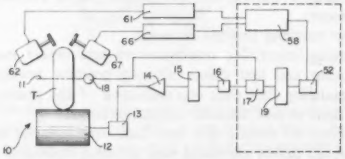
synchronizing means connected with said measuring machine, grinding machine and transfer means for synchronizing their operation.

4,112,630

REDUCTION OF LATERAL FORCE VARIATIONS OF A TIRE EFFECTIVE IN BOTH FORWARD AND REARWARD SENSES OF ROTATION

Jack E. Brown, Jr., Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 8, 1977, Ser. No. 822,770
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—281 R **3 Claims**



1. Method of reducing lateral force exerted by a tire, on the surface on which the tire rolls, in a direction parallel to the rotational axis of the tire, which method comprises determining for each successive increment of circumference of the tire the summation of the lateral force of such increment measured while the tire rotates in a first rotational sense and the lateral force of such increment measured while the tire is rotated in the opposite rotational sense, generating a variant signal proportional to said summation of said successive increments of circumference, and grinding the tire to reduce the variation of

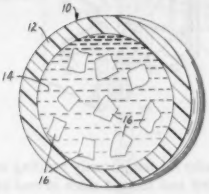
said signal from its mean value thereby effecting a reduction in the total lateral force variations in the tire.

4,112,631

ENCAPSULATED ABRASIVE GRAINS AND ARTICLES MADE THEREFROM

Robert N. Howard, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 29, 1973, Ser. No. 364,671
Int. Cl.[2] B24D *3/06, 3/24*
U.S. Cl. 51—295 **6 Claims**



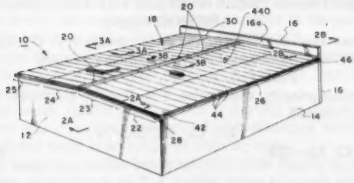
1. A coated abrasive product in which a layer of capsules is bonded to a flexible sheet backing by a cured binder, said capsules being spheroidal and containing a plurality of abrasive grains dispersed in a lubricant, the abrasive grains having a nominal diameter of from about 0.5 to 25 microns and constituting about 5–30% by volume of capsule content, the diameter of said capsules being in the range of about 10–200 microns and at least about twice the nominal diameter of said abrasive grains, the capsule walls consisting of gelatin or resinous materials formed by interfacial encapsulation.

4,112,632

PREFABRICATED WATERTIGHT STRUCTURAL SYSTEM

Harold G. Simpson, Oklahoma City, Okla., assignor to Star Manufacturing Company of Oklahoma, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 336,364, Feb. 27, 1973, and Ser. No. 624,587, Oct. 22, 1975. This application Oct. 28, 1975, Ser. No. 625,883
Int. Cl.[2] E04B *7/00;* **E04D** *13/06*
U.S. Cl. 52—11 **12 Claims**



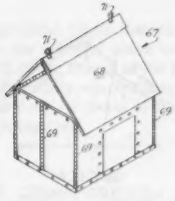
1. The building system comprising:
- a plurality of exterior water repellant walls each having interior and exterior surfaces and a substructure for a roof deck extending between the walls;
- a plurality of panels arrayed on the supporting substructure to provide a continuous roof deck extending thereover having a top surface and an edge surface; and
- a continuous chloro sulfonated polyethylene membrane bonded to the roof deck including an edge flashing portion extending over the edge surface of the roof deck and connected to the water repellant walls for preventing water from reaching the interior surface of the walls, the continuous chloro sulfonated polyethylene membrane including a plurallity of chloro sulfonated polyethylene mechanical strip fasteners and sealing means interconnecting a plurality of chloro sulfonated polyethylene panels, and wherein
- the exterior walls include walls disposed below the edge of the roof deck which include panel means disposed along the upper edge of said walls having an upper edge inset from and disposed above the bottom edge of the edge surface of the roof deck;
- the flash portion of the continuous chloro sulfonated polyethylene membrane extends downwardly around the bottom edge of the edge surfaces of the roof deck, then inwardly and upwardly over the top edge of the panel means and then down behind the panel means; and
- the panel means sheds water away from the interior face of the wall.

4,112,633

PROTECTIVE WORKMAN AND EQUIPMENT COVERS

Frank L. Mitchell, 4929 S. Troost, Tulsa, Okla. 74105

Division of Ser. No. 543,874, Jan. 24, 1975, Pat. No. 3,968,602. This application Mar. 24, 1976, Ser. No. 669,723
Int. Cl.[2] E04B *1/346*
U.S. Cl. 52—66 **1 Claim**



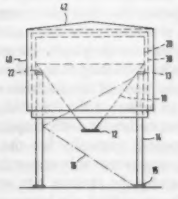
1. Equipment and personnel protection means comprising a plurality of vertical standing panels to form a rectangular enclosure, hinges at the junction of the panels, a hinge in the center of the two end panels, a pair of horizontal hinges along the top edges of the two side panels, a pair of relatively large roof panels connected to the horizontal hinges, and locking tabs along the top edge of one roof panel to project through holes in the top edge of the other roof panel whereby the roof panels may fold inwardly and the end panels may pivot outwardly to provide a dismantled substantially flat structure.

4,112,634

STORAGE BIN

Wilma Bissinger, Muhlstrasse 30, D-7129 Pfaffenhofen, Germany

Filed Feb. 25, 1977, Ser. No. 772,251
Claims priority, application Fed. Rep. of Germany, May 12, 1976, 2621009
Int. Cl.[2] E04B *1/346*
U.S. Cl. 52—67 **17 Claims**



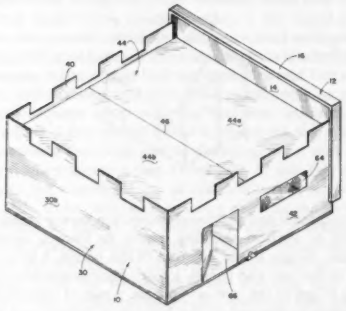
1. A storage bin such as a silo or the like comprising a plurality of sections adapted to be superimposed one on the other, said sections increasing stepwise in external dimension, in axial succession from bottom to top of said bin, and being telescop-

ingly nested together between a collapsed and an extended position, said sections being provided with an outwardly directed flange adjacent their upper edge and an inwardly directed flange adjacent their lower edge, said flanges having overlapping surfaces whereby the outwardly directed flange of a lower section engages over the inwardly directed flange of the next contiguous upper section, and means for removably securing said sections together comprising at least one pivotable latch removably mounted on the outer surface of the respective lower component spaced below the outwardly extending flange, said latch being adapted to be pivoted into engagement with the inwardly directed flange of the next adjacent section to apply a clamping force thereagainst said inwardly directed flange against the adjacent outwardly directed flange.

4,112,635
CHILD'S PLAYHOUSE TYPE COLLAPSIBLE STRUCTURE

DeMaris C. Rylander, 4521 E. 55th St., Tulsa, Okla. 75135

Continuation of Ser. No. 640,538, Dec. 15, 1975, abandoned.
This application Jun. 24, 1977, Ser. No. 809,636
Int. Cl.² E04B *1/344*
U.S. Cl. 52—69 8 Claims

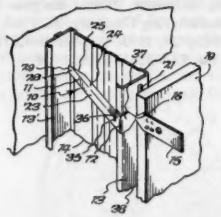


1. A collapsible playhouse type structure comprising main storage box means secured to a wall of a room and having the exposed side thereof open to the interior of the room, first plate means hingedly secured to the main storage box means and movable between a storage position within the confines of the storage box and an extended position beyond the open face in the proximity of the surface of the ground and substantially perpendicular with respect to the storage box to provide a half-floor for the playhouse type structure, second plate means hingedly secured to the first plate means along the edge thereof oppositely disposed with respect to the storage box means and movable between a folded position adjacent the first plate means and an extended position providing a second half-floor section substantially co-planar with the extended first plate means, said second plate means including a foldable section attached thereto opposite the first plate means and movable between a collapsed position and a substantially upright position to provide a sidewall for the playhouse type structure, said second plate means also including first and second flap means secured to the opposite ends of the foldable section and movable between positions adjacent the foldable section and positions substantially perpendicular with respect thereto to provide oppositely disposed sidewalls for the playhouse type structure, said flap means removably engagable with said storage box section whereby the storage box section provides a fourth sidewall for the assembled playhouse structure, and said first and second plate means being collapsible for storage within the confines of the storage box means whereby the collapsed playhouse type structure is unobstructive in the room when not in use.

4,112,636
WALLBOARD LAMINATING CLIP

Joseph C. Hays, 340 Woodbridge Ave., Buffalo, N.Y. 14214

Filed Mar. 14, 1975, Ser. No. 558,310
Int. Cl.² E04B *1/38*
U.S. Cl. 52—98 33 Claims

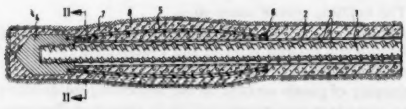


1. A laminating clip for temporarily holding adjacent planar members having first and second sides in end-to-end relationship with a seam therebetween relative to a base member with said first sides facing toward said base member comprising attachment portion means for permanent attachment to said base member, first portion means including side means for lying flat against said base member, said first portion means having first and second ends with said first end formed integrally with said attachment portion means, second portion means for extending substantially perpendicularly to said side means and for extending through said seam between said planar members, said second portion means having first and second ends with said first end of said second portion means being formed integrally with said second end of said first portion means, retaining member supporting means on said second portion means for supporting retaining member means in retaining engagement with said second sides of said planar members, and severable means connecting said first end of said second portion means to said second end of said first portion means to permit said second portion means to be severed from said first portion means after said planar members have been secured relative to said base member by permanent attaching means, said severable means being located on said clip for positioning between said base member and said second sides.

4,112,637
REMOVABLE PRESS ANCHOR WITH DESTRUCTIBLE ANCHOR BODY

Thomas Herbst, Munich, Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

Filed Feb. 10, 1977, Ser. No. 767,316
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1976, 2606095
Int. Cl.² E02D *5/74*
U.S. Cl. 52—155 6 Claims



1. A removable press anchor comprising a tubular sheathing, a traction element removably carried and arranged for longitudinal movement within said tubular sheathing, and a destructible anchor body releasably connected with said traction element, said anchor body being embedded in a press body formed by pressing in hardening material, said anchor body comprising a head and a plurality of rods connected thereto being formed of glass fibers, whereby said anchor body is destructible by exerting forces extending transverse to the

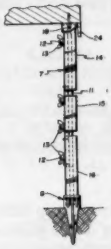
longitudinal axis thereof so as to be capable of absorbing large forces in the direction of its longitudinal length and only small forces in the direction transverse to its longitudinal length.

4,112,638

SKIRT MOUNTING DEVICE FOR MOBILE HOMES

Paul D. Hanson, Sr., Minneapolis, Minn., assignor to Technical Plastics Corporation, St. Paul, Minn.

Filed Mar. 17, 1977, Ser. No. 778,575
Int. Cl.[2] E02D *27/00*
U.S. Cl. 52—169.12 **14 Claims**



1. A longitudinally adjustable skirt mounting device for mobile homes and the like, comprising:
(a) an elongated rigid shank member having upper and lower end portions;
(b) a plurality of mounting members each shorter than said shank member and slidably mounted thereon for relative longitudinal movement therebetween;
(c) releasable securing means associated with said shank member and said mounting members to permit adjustment of the position of the latter along the length of said shank member and securing the same thereat;
(d) at least some of said mounting members having portions thereof made of material adapted to have skirting panels secured thereto;
(e) a sleeve member adapted to telescopingly receive the lower end portion of the lowest of said mounting members therein in close-fitting relation and to be slid upwardly therealong;
(f) a base stake fixedly carried by said sleeve member at one side thereof and extending downwardly therefrom to fix said sleeve member and said shank member to the ground when said base stake is extended thereinto;
(g) a rigid mounting socket adapted to receive the upper end of the uppermost of said mounting members therein in close-fitting relation;
(h) means for rigidly affixing said mounting socket to the upper end of said uppermost of said mounting members when the latter is so received therein; and
(i) said mounting socket being adapted to be fixedly secured to the underside of such a mobile home adjacent the periphery of the latter whereby skirting panels may be mounted upon and supported by said mounting members in desired position relative to the mobile home.

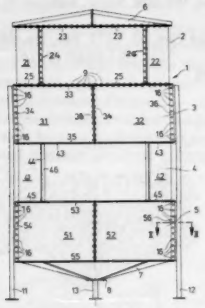
4,112,639

SHELL SILO

Adolf Zimmermann, Osterburken, Fed. Rep. of Germany, assignor to AZO-Maschinenfabrik Adolf Zimmermann, Germany

Filed Feb. 18, 1977, Ser. No. 770,018
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1976, 2606582
Int. Cl.[2] E04H *7/30*
U.S. Cl. 52—174 **4 Claims**

1. Shell-type silo consisting of several superimposed stages, stabilizer legs attached to said stages, each stage being formed from several arcuate shells, said shells having a flange along each of the longitudinal edges of said shells substantially radially thereof and being connected by screws to the flanges of respective circumferentially adjacent shells, and a sealing means inter-posed between the flanges of said adjacent shells, characterized in that each of the stabilizer legs are provided



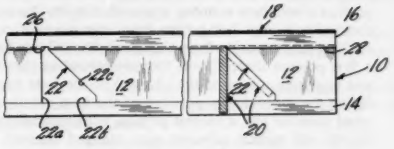
with a single longitudinal flange that extends radially with respect to the silo, the width of which corresponds approximately to the width of the flanges of the shells, and which is attached to circumferentially adjacent flanges of the shells of at least the lowermost panel by means of the screws joining the flanges of the shells together.

4,112,640

FOOT GRILLE

Howard B. Reifsnyder, Williamsport, Pa., assignor to Construction Specialties, Inc., Cranford, N.J.

Filed Dec. 5, 1977, Ser. No. 857,793
Int. Cl.[2] E04F *19/10*
U.S. Cl. 52—177 **6 Claims**



1. In a foot grille having a multiplicity of parallel closely-spaced elongated tread rails, each of which is generally T-shaped in cross section, is of substantially uniform cross section along its length and includes in cross section an upper flange, a lower flange and a web portion, and at least two spaced-apart key lock bars extending transversely of the rails, passing through the web portions of the rails and rigidly interconnecting the rails, the improvement wherein the web portion of each rail has longitudinally spaced-apart generally triangular cut-outs, each of which has a vertical edge substantially perpendicular to the longitudinal axis of the rail and extending substantially the full height of the web portion between the flanges, a lower edge substantially co-extensive with the juncture between the web portion of the lower flange and an oblique edge having a length not less than the height of the lock bar such that the lock bar can be passed lengthwise through the cutout, and wherein each lock bar has a height greater than the height of the web portion of the rail and has notches along its lower edge receiving and engaging lower flanges of the rails, portions of the upper edge of each lock bar engaging at least two areas on the underside of the upper flange of each rail at loca-

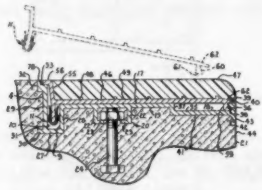
tions spaced a substantial distance from each other lengthwise of the lock bar, and portions of one face of each lock bar engaging the vertical walls of the cutouts in the rails.

4,112,641

STAIR NOSING STRUCTURE

Claude P. Balzer, Wichita, Kans., assignor to Balco, Inc., Wichita, Kans.

Filed Oct. 27, 1977, Ser. No. 846,153
Int. Cl.[2] E04F *11/16*
U.S. Cl. 52—179 **11 Claims**



1. A stair nosing structure for stair steps comprising:
(a) an elongated, substantially rigid base member having forward and rearward longitudinal edges, and including:
(1) an anchor portion for mounting said base member on a stair step;
(2) an interlocking portion disposed adjacent one of said forward and rearward edges;
(3) a channel portion having opposing faces and being disposed adjacent the other of said forward and rearward edges and extending therealong;
(b) an elongated tread member overlying said base member, being supported thereby, and including:
(1) an interlocking portion matingly engaging the interlocking portion of said base member and preventing relative vertical translation therebetween;
(2) a depending rib having opposed surfaces disposed between and spaced from the opposing faces of said channel portion; and
(c) a plurality of fastening clips disposed in the channel portion of said base member in spaced relation therealong; each of said clips being bent from one piece of rigidly resilient sheet metal to form a channel shaped body having a first portion thereof with tongues extending therefrom and engaging a face of the channel of the base member facing the interlocking portions of the base member and tread member and a second portion with tongues engaging the rib surface adjacent said engaged channel face, said depending rib of the tread member compressing said clips in said channel portion of the base member and increasing the engagement between the tongues and rib surface and channel face to resist removal of the rib from said channel portions, the resiliency of the compressed clips urging the mating interlocking portions of the base member and tread member together for cooperation with the engagement of said clip tongues with the rib and base member channel face in retaining the tread member on the base member.

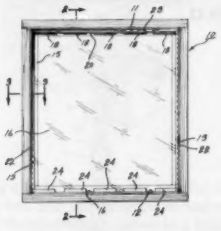
4,112,642

INSULATING INSTALLATION FOR A WINDOW FRAME

Paul D'Aragon, 21 St-Jacques St., St-Sauveur des Monts, Quebec, Canada

Filed May 2, 1977, Ser. No. 792,498
Int. Cl.[2] E06B *3/26*
U.S. Cl. 52—202 **7 Claims**

1. A temporary transparent insulating installation for mounting on the inside of at least one glazing of a window frame with a top surface, bottom surface, and two side surfaces, the installation comprising a clear plastic sheet having a length greater than the height of the window frame, and a width slightly less than the width of the window frame, and having a first connecting strip along a top edge, the sheet having flexible and elastic sealing means adapted to seal with two side surfaces and top surface of the window frame, said sealing means comprising a strip of flexible and elastic material attached at the side and top edges of the sheet and which, when said installation is mounted on a window frame, bends into a substantially L-shaped configuration with one leg pressing directly against the respective side surfaces and top surface of the window frame,



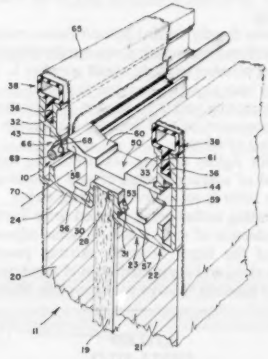
such that the flexible strips take up differences in width due to contraction or expansion of the plastic sheet, a second sheet connecting strip permanently attached to the top surface of the window frame, adapted to provide an immovable mating connection with the first connecting strip along the top edge of the plastic sheet, and at least one weight adapted to hold down the plastic sheet on the bottom surface of the window frame, forming a substantially L-shaped configuration such that rearrangement of the holding weight can be made to remove wrinkles in the plastic sheet.

4,112,643

SNUB ASSEMBLY FOR SECURING COVERING MATERIAL TO A WALL PANEL MODULE

Lloyd Burr Decker, Colon, Mich., assignor to Harter Corporation, Sturgis, Mich.

Filed May 9, 1977, Ser. No. 795,415
Int. Cl.[2] E04B *1/82*
U.S. Cl. 52—222 **5 Claims**



1. A snubbing assembly for releasably securing a sheet of covering material onto the face of a wall panel module having a peripheral frame, said peripheral frame being comprised of channels having a web wall and at least one side wall, the channels being disposed with the web wall facing inwardly with respect to the wall panel module and the side wall extending outwardly with respect to the wall panel module, a longitudinal flange extending parallel with the side wall and spaced laterally inwardly thereof, a snub being presented from said

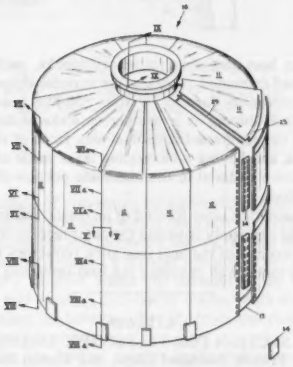
longitudinal flange, a medial rib being provided along the web wall of the channels forming the wall panel frame, at least one retainer clip, said retainer clip recessed matingly to receive said medial rib, means by which selectively to secure the body portion of said retainer clip to said medial rib, gate means being presented from said retainer clip, a sheet of material having a marginal edge portion being disposed on the face of the wall panel module, an anchor means secured to the marginal edge portion of said covering material, the marginal edge portion of the decorative sheet extending between said opposed snub and gate means, the anchor means being releasably secured behind said snub and gate means tautly to maintain the decorative sheet material on the face of the wall panel module.

4,112,644

FIBERGLASS TANK AND METHOD FOR MAKING THE SAME

John D. Allen, 5005 Zahm Rd., Belding, Mich. 48809

Filed Dec. 1, 1976, Ser. No. 746,465
Int. Cl.[2] B65D *7/02*
U.S. Cl. 52—245 **16 Claims**



1. Fiber tank components for forming a tank having a perimeter of prefabricated arcuate wall sections and means for joining said sections including:

an elongated joiner panel having pairs of transversely spaced protrusions extending outwardly from a panel body; said pairs being spaced along the length of said joiner panel; said joiner panel having a plurality of aligned fibers extending in said panel body between each pair of spaced protrusions and curving to extend into said protrusions so said plurality of fibers extends substantially the length of said protrusions thus having generally a U-shape and adapted to couple a force applied to one protrusion in a pair to the other protrusion in the pair; and

each of said arcuate wall sections having a plurality of openings spaced from an edge of said section to be coupled to the openings of another such section; said first and second openings shaped and spaced to receive a pair of protrusions of said joiner panel.

4,112,645

PORTHOLE ARRANGEMENT

Frederick Dale Greenfield, 25028 S. Vermont, Harbor City, Calif. 90710

Filed Mar. 16, 1977, Ser. No. 778,095
Int. Cl.[2] E06B *1/14*
U.S. Cl. 52—304 **16 Claims**

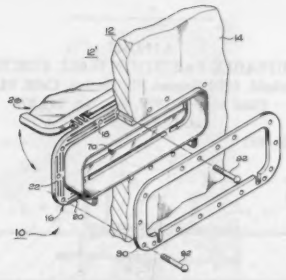
1. In a porthole arrangement for mounting on the wall of a vehicle the improvement comprising, in combination:

an interior frame means, having top, bottom and opposed side walls;

a fitting means having top, bottom and opposed side walls coupled to said interior frame means and extending through the wall of the vehicle from the interior to regions exterior thereof and each of said interior frame means and said fitting means having first walls defining a aligned aperture therethrough;

screen bracket means comprising an upstanding rim means coupled to said first walls of said fitting means and extending therearound and into said aperture therein a first preselected distance and spaced from said interior frame means a second preselected distance;

a transparent rain shield means coupled to said interior frame means along said bottom wall thereof and projecting a third preselected distance into said aperture therein, and



said third preselected distance greater than said first preselected distance;

said screen bracket means having drain aperture walls therethrough defining water drain means along said bottom wall of said fitting means and providing communication between said bottom wall of said fitting means and said bottom wall of said interior frame means;

U-shaped channel means coupled to said bottom wall of said fitting and extending therebelow and having walls defining a U-shaped channel;

first water passage means extending through said bottom wall of said fitting means and communicating with said U-shaped channel; and

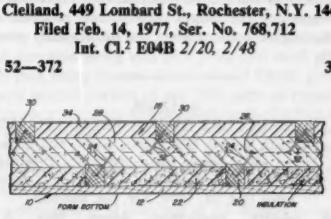
second water passage means extending through said bottom wall of said interior frame means and communicating with said U-shaped channel.

4,112,646

PRE-CAST INSULATED WALL STRUCTURE

John J. Clelland, 449 Lombard St., Rochester, N.Y. 14606

Filed Feb. 14, 1977, Ser. No. 768,712
Int. Cl.[2] E04B *2/20, 2/48*
U.S. Cl. 52—372 **3 Claims**



1. A panel for use as a building unit and including large, planar, spaced side faces interconnected by parallel end edges and parallel side edges, said panel comprising a continuous core of reinforced, monolithic cementitious material having side faces spaced inwardly from the side faces of the panel, a plurality of stud members partially embedded in each side surface of the cementitious core, said stud members being parallel to each other, laterally spaced from each other, ex-

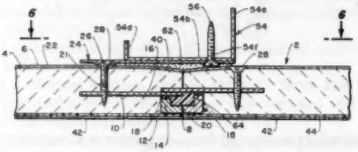
tending from side edge to side edge of the panel, having the outer surface thereof substantially flush with the side faces of the panel, and having a major portion of their thickness projecting from the core, means on each stud member embedded in the core to lock the stud members thereto, insulation panels disposed against each side face of the panel and between adjacent stud members, said insulation panels completely filling the space between adjacent stud members with the outer side faces thereof substantially flush with the side faces of the panel and the outer surfaces of the stud members, said stud members and insulation panels being assembled with core when the cementitious material is fluent for securing the stud members to the core with the insulation panels slowing moisture flow from the cementitious material while it hardens thereby controlling the curing time and strength of the core, said stud members being consturcted of material penetrable by fasteners to facilitate attachment of a finish panel to the planar side faces of the panel.

4,112,647

MOVABLE PARTITION WALL SYSTEM

Lloyd J. Scheid, 4404 Grimes Pl., Encino, Calif. 91316

Filed May 2, 1977, Ser. No. 792,873
Int. Cl.[2] E04B *2/30*
U.S. Cl. 52—481 **20 Claims**



1. Movable partition wall construction comprising the combination: spaced horizontal ceiling and floor support members having spaced intermediate vertical support members forming infrastructure adapted to receive first and second panels forming spaced first and second exterior wall surfaces, respectively, said first panel comprising a gypsum board member having a first and second lateral edges adapted to coact with like first panels in abutting relationship to form over- and underlapping joint construction, and having vertically aligned, externally concealed securement means spaced from said first and second lateral edges for dismountable securement to one of said vertical members adjacent thereto; said second panel member comprising a gypsum board member similar in construction to said first panel and additionally including spaced spring clip means adapted to cooperatively engage an adjacently positioned vertical member in retained and releaseable fashion, said lateral edges of said first and second panels having a recessed notched portion extending the length thereof, said recessed notched portion having a communicating slot substantially coextensive therewith.

4,112,648

WALL STRUCTURE OF HOT FLUID CHAMBER

Hiroshige Suzuki, Tokyo; Eizi Horie, Aichi, and Hideo Nagashima, Tokyo, all of Japan, assignors to The President of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Oct. 31, 1977, Ser. No. 846,939
Claims priority, application Japan, Nov. 8, 1976, 51/148976[U]
Int. Cl.[2] E04G *11/04*; B65D *25/18*
U.S. Cl. 52—508 **5 Claims**

1. A wall structure of a hot fluid chamber, comprising
an inner metal wall directly contacting a hot fluid;
support pins outwardly projecting from the outer surface of the inner metal wall and equidistantly arranged in both longitudinal and lateral directions of the inner metal wall;
coupling members fixed to the inner metal wall by the support pins, each coupling member made of a heat-insulating refractory material and having a truncated quadrangular pyramid shape;
rod-like heat-insulating refractory blocks, each mounted between two adjacent coupling members, having an oblong upper face, an oblong lower face, two trapezoidal side faces conforming with and making sliding motions along the trapezoidal side faces of the coupling member, two reversed trapezoidal side faces, and a cushioning layer formed of an elastic refractory material and providing the lower portion of the rod-like block;

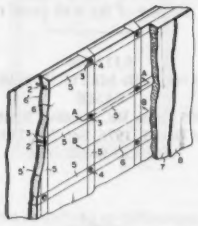


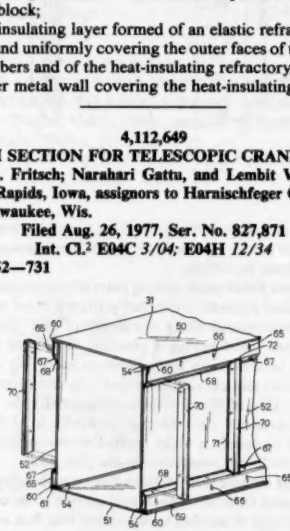
plate-like heat-insulating refractory blocks, each having a reversed truncated quadrangular pyramid shape, mounted in a concavity formed by four rod-like heat-insulating refractory blocks in a manner to make sliding motions along the reversed trapezoidal side faces of the rod-like blocks, and having a cushioning layer made of an elastic refractory material in the underside portion of the plate-like block;
a heat-insulating layer formed of an elastic refractory material and uniformly covering the outer faces of the coupling members and of the heat-insulating refractory blocks; and
an outer metal wall covering the heat-insulating layer.

4,112,649

BOOM SECTION FOR TELESCOPIC CRANE BOOM

Robert A. Fritsch; Narahari Gattu, and Lembit Vaerk, all of Cedar Rapids, Iowa, assignors to Harnischfeger Corporation, W. Milwaukee, Wis.

Filed Aug. 26, 1977, Ser. No. 827,871
Int. Cl.[2] E04C *3/04*; E04H *12/34*
U.S. Cl. 52—731 **10 Claims**



7. In a hollow rectangular boom section for a telescopic crane boom:
a top plate having lateral edges;
a bottom plate having lateral edges;
a pair of spaced apart side plates disposed between and welded to said top plate and said bottom plate at locations inwardly of the lateral edges of said top plate and said bottom plate whereby said top plate and said bottom plates have outwardly projecting edge portions, each side plate being at right angles to said top plate and said bottom plate;

a plurality of longitudinal corner stiffeners, one for each corner of said boom section, each longitudinal corner stiffener having an angular cross-section and including a flat side portion and an inwardly extending portion, each longitudinal corner stiffener being welded to a side plate and to an outwardly projecting edge portion of one of said top plates or bottom plates inwardly of a lateral edge thereof so that said flat side portion is spaced from and parallel to an associated side plate;

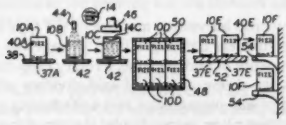
and a plurality of vertical side stiffeners, each having a U-shaped cross-section, said vertical side stiffeners disposed in spaced apart relationship along said side plates, each vertical side stiffener being welded to a side plate and to the longitudinal corner stiffeners for the side plate.

4,112,650

METHOD OF PREVENTING CONTAMINATION OF BEVERAGE CONTAINERS

Hubert J. Tucker, 6600 Marguerite La., Little Rock, Ark. 72201

Continuation of Ser. No. 639,447, Dec. 10, 1975, abandoned.
This application May 27, 1977, Ser. No. 801,340
Int. Cl.[2] B65B *3/00, 55/00, 61/18*
U.S. Cl. 53—412 **8 Claims**



1. The method of preventing contamination of the discharge end of a beverage container which has a tear out portion in one end of the container and means for tearing the tear out portion of the container to leave a discharge opening in the end of the container at a location where the surfaces of the container, adjacent to said opening, necessarily contact with the lips of a person drinking the beverage directly from said opening, said method comprising:

(a) locating the tearout portion in the bottom wall of the container and recessing the bottom of the container so that it forms a compartment between the container bottom and a plane determined by a bottom edge of a side wall of the container with the recess high enough above said plane so that the tear out portion and areas of the container bottom around the tear out portion are spaced from any flat surface on which the container is placed with the bottom of the container confronting said surface,

(b) filling the container through the top thereof, and then closing and sealing the top of the container,

(c) placing lettering on the side of the container with at least the predominant part of the lettering oriented so that the lettering is right side up only when the container is oriented with its bottom end lowermost,

(d) storing and merchandising the container with the compartment containing the tear out portion at the bottom and closed by a surface on which the container rests and with the compartment containing the tear out portion and said means for tearing it protected from dust, dirt and insect sprays by the part of the container covering the compartment.

(e) displaying the conainer during merchanising with information displayed that said container opens at the bottom, and

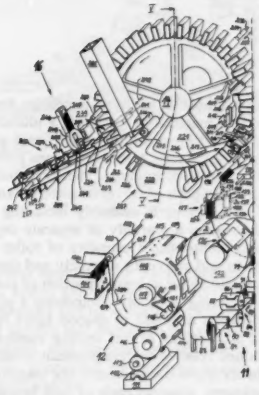
(f) continuing the protection of the tear out portion and its adjacent area from contamination after sale of each individual container by placing and supporting said container, even though separated from a merchandizing pack, on an underlying surface to thereby close said bottom compartment during storage by the purchaser while awaiting opening and discharge of the container through said discharge opening.

4,112,651

METHOD AND MACHINE FOR THE PRODUCTION OF HINGED-LID PACKS FOR GROUPS OF CIGARETTES OR THE LIKE

Dietrich Bardenhagen, Hamburg, and Bernhard Schubert, Neubörnsen, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Fed. Rep. of Germany

Division of Ser. No. 455,926, Mar. 28, 1974, Pat. No. 4,004,395, which is a division of Ser. No. 331,028, Feb. 9, 1973, Pat. No. 3,802,325. This application Nov. 10, 1976, Ser. No. 740,368
The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.
Int. Cl.[2] B65B *41/18, 57/00*
U.S. Cl. 53—449 **12 Claims**

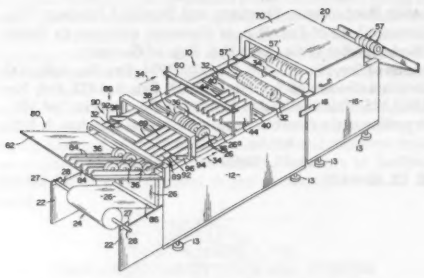


1. A method of making packs for groups of cigarettes or analogous rod-shaped articles wherein each pack consists of a plurality of components including at least one inner envelope, an outer envelope provided with a pivotable lid and an insert disposed between said inner and outer envelopes and having edge portions for performing at least one of the functions of yieldably retaining the lid in closed position and guiding the lid during pivoting between open and closed positions, comprising the steps of establishing a source of groups of articles and discrete sources of first, second and third blanks for conversion into inner envelopes, corresponding inserts and corresponding outer envelopes of packs; transporting successive groups, first second and third blanks along first, second, third and fourth paths toward discrete first, second, third and fourth portions of a fifth path; transporting said groups and said blanks in predetermined direction along said fifth path, said third portion of said fifth path being located ahead of said fourth portion but behind said second portion of said fifth path, as considered in said direction; converting sets of blanks each of which includes a first, a corresponding second and a corresponding third blank into packs each of which confines the corresponding one of said groups not later than in said fifth path; monitoring at least one of said third and fourth paths; producing signals in response to detection of at least one of the defects including the absence and improper transport of blanks along said one path; interrupting the transport of corresponding blanks along said second path and the other of said third and fourth paths in response to said signals; interrupting the transport of corresponding groups along said first path in response to said signals; and completing the conversion of each of said blanks into a pack irrespective of the interruption of transport of blanks in response to said signals.

4,112,652
HOT WIRE PACKAGING MACHINE

William A. Bodolay, 5621 Live Oak Rd., Lakeland, Fla. 33803

Filed Sep. 9, 1976, Ser. No. 721,833
Int. Cl.[2] B65B *11/04*
U.S. Cl. 53—211 9 Claims

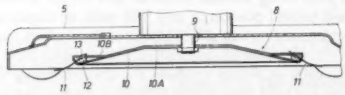


1. A packaging machine of the type primarily designed to utilize heat shrinkable material in wrapping a plurality of objects having a predetermined configuration, said packaging machine comprising: a housing, transport means comprising a conveyor assembly movably mounted on said housing and at least partially defining a path of travel of material and objects being packaged; said conveyor assembly including wrapper means structured to wrap a plurality of separate objects in a single wrapper and comprising a plurality of roller elements rotatably attached to said conveyor assembly and disposed for constant rotary motion along at least a portion of said path of travel, a material severing assembly comprising a plurality of heated cutting elements disposed in spaced apart relation to one another, said plurality of heated cutting elements correspondingly positioned relative to said constant rotating roller elements and in interruptive disposition to the material and the objects being packaged, wherein each of said heated cutting elements comprise a substantially elongated configuration and extend along and in spaced above relation to said predetermined portion of said path of travel and further angularly oriented in a declining relation to said path of travel where constant rotary motion of said roller elements occurs, whereby the objects being packaged are maintained in rotary motion during severing of the material by said heated cutting elements into a plurality of individual packages.

4,112,653
LAWN MOWER AND METHOD

George C. Ballas, and Albert W. Mitchell, both of Houston, Tex., assignors to Weed Eater, Inc., Houston, Tex.

Filed Apr. 7, 1976, Ser. No. 674,323
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—12.7 34 Claims



1. In a rotary-type lawn mower having a wheeled chassis adapted to travel over a greensward and carrying a motor having a rotatable shaft, the improvement comprising:

a head member having at least one peripheral aperture and mounted on said shaft for rotation in a cutting path aligned substantially parallel with said greensward and intersecting vegetation thereon,

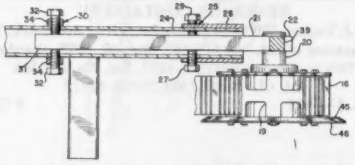
at least one one non-metallic cord-like cutting member disposed partially in said head member and having a finger-like free traveling end portion extending from said aperture outwardly of said head member into said cutting path, and

support means having an elongate passageway connecting with and extending with said head member from said aperture for restraining an adjacent portion of said cutting member along a length sufficient to support said free traveling end portion of said cutting member against deflection from said cutting path by said vegetation.

4,112,654
ROTARY KNIFE ADJUSTER ASSEMBLY

Donald A. Picha, Plainfield, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Dec. 23, 1976, Ser. No. 753,751
Int. Cl.[2] A01D *45/02, 55/32*
U.S. Cl. 56—98 11 Claims

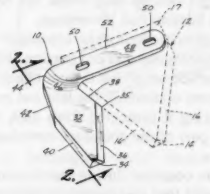


1. In a row crop harvesting machine of the type including a pair of crop dividers defining a crop passageway having an opening forwardly of said machine, a rotary crop cutting knife mounted to the frame of one of said dividers adjacent the forward end of said passageway, said knife having a rotational axis and a cutting plane perpendicular thereto, drive means for said rotary knife, and cooperative cutting means associated with said knife such that the crop stalks are cut therebetween, the improvement wherein said knife is mounted to said divider frame by mounting means providing a tilting adjustment of said cutting plane relative to said cooperative means about an axis generally transverse of the said divider, said mounting means comprising a bar having a portion extending longitudinally within said divider frame, said rotary knife being rotatably mounted to and dependent from the portion of said bar extending externally of said divider frame and a plurality of vertically adjustable clamping means for clamping the bar within the divider frame, said clamping means providing independent vertical adjustments of the rearward portion of said bar and of the forward portion of said bar within said divider frame.

4,112,655
END SECTION FOR A RECIPROCATING MOWER

Hubert H. Henry, Rte. 2, Bedford, Iowa 50833

Filed Jan. 14, 1977, Ser. No. 759,337
Int. Cl.[2] A01D *55/02*
U.S. Cl. 56—301 4 Claims



1. An end section for a reciprocating type mower, having a mower bar, a backing bar adapted to reciprocate within a channel formed in the mower bar, and a plurality of standard sickle sections spaced along the backing bar and attached thereto, said end section comprising:

a first portion disposed outwardly of and coplanar with the

next adjacent standard sickle section and extending forward of and normal to the mower bar, said first portion including:

a single point extending forward of the mower bar;

an inner cutting edge extending inwardly and rearwardly of said point to the outboard cutting edge of the next adjacent standard sickle section;

a blunt inner edge extending outwardly and rearwardly from the rearwardmost portion of said inner cutting edge along the outboard cutting edge of the next adjacent standard sickle section;

an outer cutting edge extending outwardly and rearwardly of said point, said inner and outer cutting edges being disposed at opposite and equal angles from a line extending through said point and normal to the mower bar;

a blunt outer edge extending rearwardly from the rearwardmost portion of said outer cutting edge and disposed normal to the mower bar; and

a second portion extending inwardly of said first portion and formed above the plane of said first portion such that the lower surface of said second portion is coplanar with and contacts the upper surface of the next adjacent standard sickle section, said second portion having holes formed therein registerable with holes formed in the underlying standard sickle section, for providing attachment of said end section to the backing bar via the next adjacent standard sickle section.

4,112,656

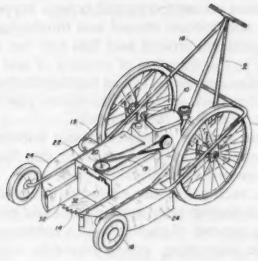
LAWN MOWING BRUSH CUTTER

Jerry Ranko, 504 Reiss St., Meraux, La. 70043, and Frederick E. Ranko, 2709 Barton Dr., Meraux, La. 70075

Continuation-in-part of Ser. No. 645,777, Dec. 31, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,596

Int. Cl.[2] A01D *55/18*

U.S. Cl. 56—320.1 **3 Claims**



1. A lawn mowing brush cutter comprising in combination:

a. a cart having a base with a forward center recess, a pair of small front wheels, a pair of large weight carrying rear wheels, and a rear handle for propelling and guiding said cart by said large wheels;

b. a power supply mounted on said cart between said pair of weight carrying rear wheels and forwardly of said rear handle;

c. dual purpose cutter means horizontally mountable on said cart and in said base and between said front wheels and said power supply for rotation by the power supply to cut swathes of brush and grass defined by the forward center recess in said base;

d. a single purpose mowing means mountable on said dual purpose cutting means in radial extension thereof and in combination therewith for mowing a wider swathe of grass than said dual purpose cutter means; and

e. base adapter means including (1) a removable cover means for covering said forward center recess to make said base continuous and permitting said dual purpose cutter means and said single purpose cutter means to cut grass and (2) a removable recess member positionable with said forward center recess and cooperable with said dual purpose cutter means to establish and mowing swathes.

4,112,657

BEATER FOR A GRAPE HARVESTING MACHINE, AS WELL AS GRAPE HARVESTING MACHINES PROVIDED WITH SUCH A BEATER

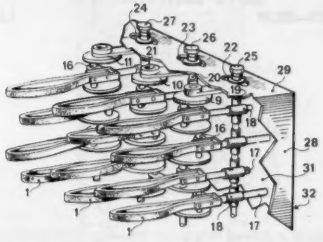
Bernard Henri Jean Bénac; Jacques Marie Lucien Bénac, and Henri Bénac, all of Berdoues par Mirande (Gers), France

Filed Mar. 4, 1976, Ser. No. 664,003

Claims priority, application France, Mar. 7, 1975, 75 07302; Feb. 24, 1976, 76 05100

Int. Cl.[2] A01D *46/00*

U.S. Cl. 56—330 **10 Claims**



1. A beater apparatus for harvesting grapes comprising an elongated body, said elongated body formed of a vane of resilient material having at least one longitudinal opening, and means for driving said elongated body in a substantially elliptical movement, said opening of the vane is made by several perforations connected by grooves having a width smaller than the perforations.

4,112,658

SPINNING APPARATUS FOR SPUN YARN

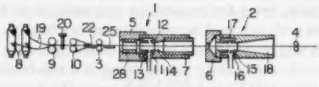
Toshihumi Morihashi, Kyoto, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed May 3, 1976, Ser. No. 682,272

Claims priority, application Japan, May 6, 1975, 50-55003

Int. Cl.[2] D01H *5/28*

U.S. Cl. 57—51 **4 Claims**



1. A spun yarn spinning apparatus having a pair of front rollers and a pair of delivery rollers, which comprises first yarn twisting means disposed between the front rollers and delivery rollers and including a cylindrical yarn passage therethrough and a plurality of air injection nozzles opening into the cylindrical yarn passage tangentially of the passage at a predetermined angle with respect to the central axis of the passage and toward the delivery rollers, an untwisting device disposed adjacent to the nozzles, and second yarn twisting means disposed between the front rollers and delivery rollers including a second cylindrical yarn passage therethrough and a plurality of air injection nozzles opening into the second cylindrical yarn passage tangentially of the passage at a predetermined angle with respect to the central axis of the passage and toward the delivery rollers, wherein said air injection nozzles of the second yarn twisting means are so oriented that the direction of the helical fluid jet stream caused thereby is in counter

direction with respect to that caused by the air injection nozzles of the first yarn twisting means.

4,112,659

OPEN END SPINNING UNIT WITH A BRAKING DEVICE

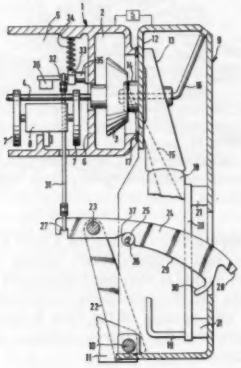
Fritz Stahlecker, Josef-Neidhart-Str. 18, 7341 Bad Ueberkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Suessen, both of Fed. Rep. of Germany

Filed Nov. 30, 1976, Ser. No. 746,068

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2555059

Int. Cl.[2] D01H *1/241, 1/12*

U.S. Cl. 57—58.89 **12 Claims**



1. Spinning machine apparatus comprising:

a spinning rotor,

a vacuum housing for said spinning rotor,

a movable housing section which forms a lid for said vacuum housing,

a first detent means on said movable housing section,

braking means for applying braking forces to the spinning rotor,

and a brake lever for controlling operation of said braking means with said braking means being in a braking position when said brake lever is in a first brake operating position and with said braking means being in a non-braking position when said brake lever is in a second brake non-operating position,

said brake lever including a second detent means and a guide surface extending from immediately adjacent said second detent means, said second detent means being configured to lockingly engage said first detent means when said housing section is in a closed position and said brake lever is in its second brake non-operating position, said guide surface being configured to engage said first detent means to maintain said brake lever in its first brake operating position whenever said housing section is moved away from its closed position such that continuous braking force is applied to said rotor for all opened positions of the housing section,

whereby said brake lever serves both as a brake control lever and a latch for said housing section, while also assuming automatic actuation of said braking means when said housing section is open irrespective of the position of said housing section.

4,112,660

APPARATUS FOR LAYING-UP TOGETHER A PLURALITY OF FRAGILE FILAMENTS

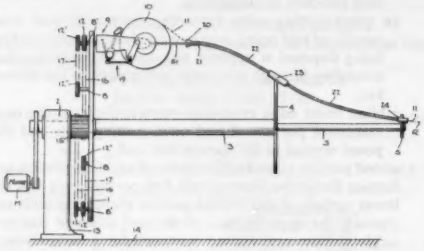
Antonio Ferrentino, Monza, Milan, and Antonio Brovedan, Milan, both of Italy, assignors to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed Aug. 30, 1977, Ser. No. 829,003

Claims priority, application Italy, Sep. 3, 1976, 26807 A/76

Int. Cl.[2] D07B *3/06*

U.S. Cl. 57—59 **19 Claims**



1. Apparatus for laying up a plurality of fine filaments comprising:

a platform for rotation around a first axis;

a plurality of bobbins, one for each of said filaments, each bobbin having a second axis about which it rotates when a filament is fed therefrom;

a plurality of bobbin support means, one for each of said bobbins, mounted on said platform and, rotatably mounting said bobbins around and spaced from said first-mentioned axis, said support means mounting said bobbins for rotation both around a third axis parallel to said first axis and perpendicular to the bobbin second axis and around said second axis;

driving means connected to said bobbin support means for rotating said bobbins around said third axis with rotation of said platform around said first axis but in a direction opposite to the direction of rotation of said platform;

braking means connected to said bobbins for braking them as the filaments are unwound therefrom and maintaining a constant tension on the filaments;

and filament support means from said bobbins on the side thereof opposite from said platform, said filament support means comprising a plurality guide tubes, one for each filament, each guide tube extending from adjacent a bobbin to a laying-up point spaced from said platform, means securing one end of each tube to a bobbin support means and tube supporting means rotatably supporting each guide tube.

4,112,661

OPEN-END SPINNING MACHINE AND A METHOD OF STOPPING THE SAME

Yoshihisa Suzuki, Nagoya; Katuaki Sugiura, Okazaki; Osamu Suzuki, Obu, and Ichiro Tashiro, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Japan

Filed Apr. 15, 1977, Ser. No. 787,760

Int. Cl.[2] D01H *1/12, 13/16, 15/00*

U.S. Cl. 57—34 R **8 Claims**

3. An open-end spinning machine comprising:

feed rollers for supplying fibers to a combing roller so as to comb the fibers;

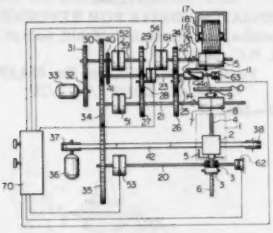
a spinning rotor for collecting said combed fibers into a yarn and for twisting said yarn;

a pair of draw off roller means, for withdrawing said yarn from said spinning rotor, having a first means for engaging with and disengaging from a power source thereof;

a traverse guide for traversing said withdrawn yarn along a

bobbin supported by cradle means, said traverse guide being connected to a second means for engaging with and disengaging from a power source thereof;

a winding drum, for frictionally driving said bobbin to wind said yarn around said bobbin and form a cheese, connected to said first means, and;



controlling means, for controlling the above-mentioned two means according to a predetermined program, by which said traverse guide is stopped before both said draw off roller means and said winding drum are stopped.

4,112,662

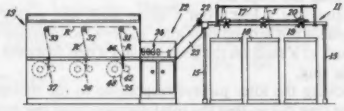
WINDING MACHINES

James Lappage, Christchurch, New Zealand; Neil Doggett, Middleton, and Stephen William Yates, Bolton, both of England, assignors to Platt Saco Lowell Limited, Rossendale, England

Continuation-in-part of Ser. No. 615,189, Sep. 19, 1975, abandoned. This application Apr. 26, 1977, Ser. No. 790,877

Int. Cl.² D01H *5/28*

U.S. Cl. 57—34 AT **10 Claims**



1. Apparatus for winding an elongate fibrous material comprising: package tube mounting means to support first and second package tubes in winding positions in transversely spaced parallel relationship; a material delivery arm for delivering material first to one of the package tubes to form a first package and then to the other of the package tubes to form a second package; drive means for rotating the package tubes for winding on material; said delivery arm being arranged during the building of a package to contact the package at a winding-on point which lies in a plane containing the axes of rotation of the two package tubes and to deliver material at the winding-on point direct to said package under a winding tension localised in the region of the winding-on point by the delivery arm; first traversing means for causing relative traversing movement between each package tube and the delivery arm in the direction of the axis of rotation of the tube for building a parallel-build package on the tube means for supporting the delivery arm, and second traversing means operative during the building of each package to monitor the increasing diameter of the package and to cause in a direction perpendicular to the axis of rotation of the tubes a relative displacement between the supporting means and the package tube to accommodate the increasing diameter of the package being built on the tube and to maintain the winding-on point in said plane.

4,112,663

METHOD OF AND APPARATUS FOR COOLING SPINNING UNITS OF OPEN-END SPINNING MACHINES

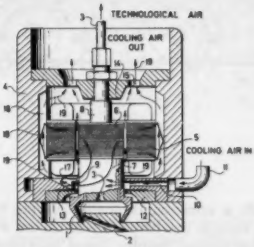
Milan Chrtek, Ceska Trebova; Josef Gäbler; Frantisek Tüma, both of Usti nad Orlici; Karel Kašpárek, Zachlumi, and Ján Blaško, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Jun. 16, 1977, Ser. No. 807,003

Claims priority, application Czechoslovakia, Jul. 6, 1976, 4456/76

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.89 **5 Claims**



2. In an open-end spinning apparatus having a spinning unit with a spinning rotor and a housing therefore, a high-speed electric motor disposed in the housing, the rotor of the electric motor being directly coupled with the spinning rotor, there being a technological air flow into and through the spinning rotor of the unit, the improvement which comprises a hub connecting the rotor of the motor to the spinning rotor, means sealing the hub to the housing to isolate the motor from the interior of the spinning rotor, a supply of cooling air, means to supply said cooling air into the space within the housing downstream of said sealing means, means to conduct the thus fed cooling air to the gap between the rotor and stator of the motor, means to conduct the air issuing from such gap outwardly of the housing, a plurality of longitudinally extending by-pass passages in the housing directly communicating with the radially outer surface of the stator of the motor, and means connecting the space within the housing between the rotor of the motor and the spinning rotor which receives cooling air with the adjacent ends of the longitudinally extending by-pass passages, said by-pass passages communicating at their other ends with air-discharging openings through the wall of the housing.

4,112,664

FRICTION FALSE-TWIST DEVICE

Kurt Muhlegg, Jona, Switzerland, assignor to Heberlein Maschinenfabrik AG, Wattwil, Switzerland

Filed Oct. 3, 1977, Ser. No. 839,017

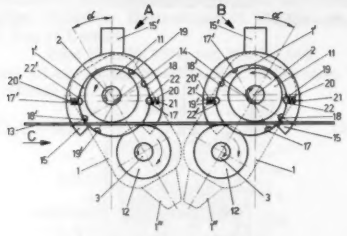
Claims priority, application Switzerland, Oct. 13, 1976, 12925/76

Int. Cl.² D01H *7/92*; D02G *1/04*

U.S. Cl. 57—77.4 **6 Claims**

1. Friction false-twist apparatus comprising a bearing unit formed therein with two journal bearing means respectively for two parallel rotary shafts, a first rotary shaft mounted in one said bearing means, a first friction element fixed to said first shaft, said first friction element comprising a first portion presenting a first convex surface of revolution about the axis of said first shaft, with said axis intersecting the convex end portion of said convex surface, and a second portion presenting a second convex surface of revolution about said axis of said first shaft and inverted relatively to said first portion to present a convex end portion of its convex surface facing oppositely to said first-mentioned convex end portion, a second rotary shaft

mounted in the other said bearing means, a second friction element in the form of a circular disc-like friction member fixed co-axially with the axis of said second shaft, said first and second portions being displaced axially from one another with respect to said axis of said first shaft and said disc-like member being formed and positioned so that its rim projects between said first and second portions, first and second driving rollers mounted coaxially respectively on said shafts, releaseable means for locking each said roller to its respective shaft whereby each said roller may be locked to or rendered loose



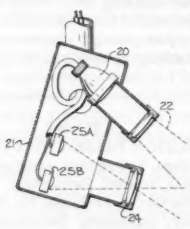
on its shaft, a common tangential driving belt arranged to travel in a straight line between said rollers, a support for said bearing unit, pivotal bearing means interposed between said bearing unit and said support whereby said bearing unit can be swivelled about a fixed axis displaced from and parallel to said first-mentioned axis towards an adjacent surface of said driving belt, and means for fixing said bearing unit in at least two positions about said fixed axis, the first of said positions being such that said rollers are free from said driving belt and the second of said positions being such that said rollers respectively engage opposite faces of said belt.

4,112,665

PLURAL SENSOR ENDS DOWN DETECTING APPARATUS

Lyman L. Werst, Acton, Mass., assignor to Parks-Cramer Company, Fitchburg, Mass.

Filed Jun. 23, 1977, Ser. No. 809,428
Int. Cl.[2] D01H *13/16*
U.S. Cl. 57—81 **6 Claims**



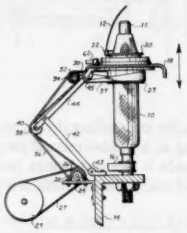
1. In the combination of an elongate textile yarn forming machine having a plurality of yarn forming stations spaced therealong, and a traveling apparatus movable along the machine and having photoelectric detector means for sensing and responding to yarns formed at the stations, an improvement in said detector means which minimizes interference with detector means operation otherwise possibly resulting from ambient lighting or machine reflection, the improvement comprising a common optical system means for focusing light reflecting from yarns, a plurality of photoelectric sensor means mounted in vertical array for receiving light passing through said optical system means from vertically spaced locations and for signalling electrically fluctuations in light received, and electrical gate means operatively connected with said sensor means for distinguishing between (a) signalling from all of said sensor means within a predetermined time period and indicative of the presence of a yarn at said locations, and (b) signalling from less than all of said sensor means and indicative of a fluctuation in ambient lighting or machine reflection.

4,112,666

COMPENSATING DRIVE FOR REVOLVING RINGS

Manuel Costales, and Moustafa I. Hakki, both of P.O. Box 884, Belmont, N.C. 28012

Filed Nov. 25, 1977, Ser. No. 854,597
Int. Cl.[2] D01H *7/58, 1/20*
U.S. Cl. 57—105 **7 Claims**



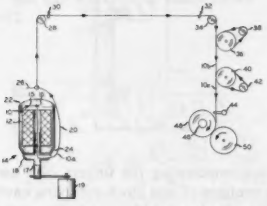
1. The improved method of rotating rings in a machine having a frame including
a. a spindle rail,
b. bobbins on the spindle rail,
c. bobbins drive means on the frame for rotating the bobbins at high speed,
d. a ring rail around each bobbin mounted on the frame to move up and down,
e. a ring on the ring rail around each bobbin,
f. said ring mounted for rotation on the ring rail, and
g. a traveler on each ring for feeding yarn to each bobbin; comprising the steps of:
h. extending a belt from a drive shaft and pulley on the spindle rail around two idler pulleys mounted on an idler shaft to a shell on the ring rail and a belt from the shell to the ring,
j. moving the idler pulleys responsive to the movement of the ring rail so that the total distance from the drive shaft to the idler shaft and from the idler shaft to the shell is always the same and the belts are always taut.

2. In a machine having a frame including
a. a spindle rail,
b. bobbins on the spindle rail,
c. bobbin drive means on the frame for rotating the bobbins at high speed,
d. a ring rail around each bobbin mounted on the frame to move up and down,
e. a ring on the ring rail around each bobbin,
f. the ring mounted for rotation on the ring rail, and
g. a traveler on each ring for feeding yarn to each bobbin; the improved structure for rotating each ring comprising;
h. a drive pulley on the spindle rail,
j. at least two idler pulleys for each drive pulley,
k. a shell journalled to the ring rail,
m. a belt trained around the drive pulley, idler pulleys and shell,
n. a ring drive belt from the shell to the rings, and
o. compensating means on the frame for moving the idler pulleys responsive to movement of the ring rail so that the total distance from the drive pulley to the idler pulleys and from the idler pulleys to the shell is always the same and the belt is always taut, and
p. said idler pulleys being mounted on the compensating means.

4,112,667
APPARATUS AND PROCESS SUITABLE FOR TWIST-DRAWING A YARN

Charles S. Hatcher, Greenville, S.C., and Kenneth E. Smith, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 22, 1977, Ser. No. 770,551
Int. Cl.[2] D01H *13/04*; D02G *3/00*
U.S. Cl. 57—157 S **12 Claims**



1. A method comprising:

passing an essentially as spun twisted yarn from a twisting zone to a guiding zone;

guiding the yarn from the twisting zone to a drawing zone, said guiding zone having at least one guiding member, each member having a cylindrical roller guide having an axis which is adjustable wherein the axis is adjusted so that the yarn rides on the surface of the roll in a relatively fixed position and substantial twist is not trapped in the yarn ahead of the guiding zone;

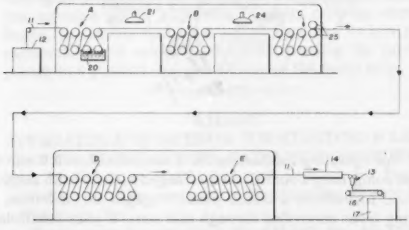
drawing the twisted yarn to produce a twisted and drawn yarn; and

winding the thus twisted and drawn yarn.

4,112,668
METHOD FOR TREATING POLYESTER FILAMENTS

Herbert A. Spiller, Pine Bluff, Ark., assignor to Monsanto Company, St. Louis, Mo., Decatur, Ala.

Continuation of Ser. No. 729,566, Oct. 4, 1976, abandoned. This application Jun. 17, 1977, Ser. No. 807,474
Int. Cl.[2] D02J *1/22*; D01G *1/06*
U.S. Cl. 57—157 S **4 Claims**



1. The method for treating polyester filaments to cause said filaments to have sufficiently low elongation and shrinkage and high tenacity and modulus for use in sewing thread, cord, twine and in cordage products, comprising

a. heating a tow of polyester filaments to about 70° – 80° C,

b. wetting the tow amd stretching the wet tow about 2.5 to 6X,

c. heating the tow to about 90° – 100° C,

d. stretching the tow 1.1 to 2X,

e. drying the tow at a temperature of about 130° – 140° C,

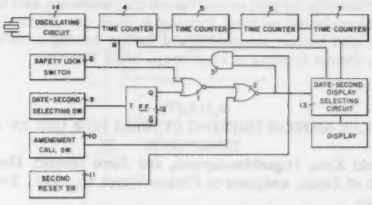
f. stretching the dried tow 1.1 to 1.2X, said stretching taking place within a sufficiently short time interval following said drying that said stretching can be accomplished without filament breakage, and

g. heat setting the tow at a temperature of 170° to 200° C for a period of at least 10 seconds.

4,112,669
DIGITAL ELECTRONIC TIMEPIECE

Noboru Kaneko, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 13, 1976, Ser. No. 732,028
Claims priority, application Japan, Oct. 13, 1975, 50/123009
Int. Cl.[2] G04B *19/24*
U.S. Cl. 58—4 A **1 Claim**



1. An electronic timepiece, comprising: an oscillator circuit for generating a repetitive time standard signal; a second counter, a minute counter, an hour counter, and a date counter connected in cascade in the named order and connected to count the time standard signal for developing respective counts representative of seconds, minutes, hours and date; a display reponsive to the counts developed by respective ones of said counters for displaying time represented by said counts; date-seconds selecting means responsive to a control signal for selectively applying a respective one of the counts developed by said second counter and said date counter under control of said control signal; and control means for applying the control signal to said date-seconds selecting means, said control means comprising a safety lock switch, a date-second selecting switch, an amendment call switch and a second reset switch each operable between an open condition and a closed condition for applying a signal, a first flip-flop connected to receive a signal applied to said date-second selecting switch and developing an output signal according to the setting of said date-second selecting switch; a first NOR-gate connected to receive an output of said flip-flop and a signal applied by said safety lock switch for developing an output signal determined by the setting of said safety lock switch and the output of said flip-flop; a second NOR-gate connected to receive the output of said first NOR-gate and a signal applied under control of said amendment call switch for developing as an output signal said control signal and for applying the same to said date-seconds selecting means; and an AND gate connected for receiving said control signal and a signal applied under control of said second reset switch and connected for applying an output thereof to reset said seconds counter when said control signal and the signal applied by said second reset switch are simultaneously developed.

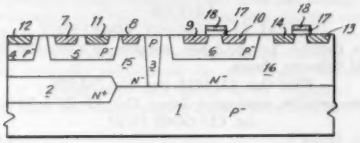
4,112,670
ELECTRONIC TIMEPIECE

Shinji Morozumi, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,946
Claims priority, application Japan, Mar. 4, 1975, 50-26703
Int. Cl.[2] G04C *3/00*
U.S. Cl. 58—23 A **21 Claims**

1. An electronic timepiece comprising timekeeping circuitry for producing timekeeping signals and display means for displaying time in response to said timekeeping signal, and an integrated circuit chip substrate, at least a portion of said timekeeping circuitry being formed of C-MOS transistors formed

on said circuit chip substrate, a further portion of said time-keeping circuitry being formed of bipolar transistors formed on said integrated circuit chip substrate and a layer of semiconductor material formed on said circuit chip substrate, said layer of semiconductor material forming at least one electrode of one of said bipolar transistors and further having a diffused region therein forming at least one C-MOS transistor.

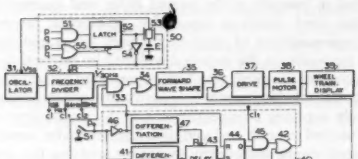


4,112,671

PULSE MOTOR DRIVING SYSTEM FOR USE IN A TIMEPIECE

Yoshiaki Kato, Higashimurayama, and Jinro Motoki, Houya, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,538
Claims priority, application Japan, Dec. 26, 1975, 51-157169
Int. Cl.[2] G04C *5/00, 9/00*
U.S. Cl. 58—23 D **10 Claims**



1. A pulse motor driving system for use in a timepiece comprising:

a. a pulse motor having a stator, a driving coil wound on said stator and a permanent magnet rotor coupled to said stator;

b. a forward correction control circuit including a forward rotation wave shaping circuit generating a pulse train having pulses of alternating polarity;

c. a reverse correction control circuit including a reverse rotation wave shaping circuit generating a reverse rotation composite pulse train having composite pulses of alternating polarity; and

d. selection circuit means selectively applying an output of said forward correction control circuit and an output of said reverse correction control circuit to said pulse motor driving circuit.

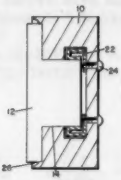
4,112,672

CLOCK DISPLAY DEVICE

Anthony Ginefra, Sr., 1184 Rockaway Ave., Brooklyn, N.Y. 11236

Filed Jul. 19, 1976, Ser. No. 706,143
Int. Cl.[2] G04B *37/00*
U.S. Cl. 58—53 **1 Claim**

1. A time keeping display device comprising, in combination: a housing portion formed of a predetermined decorative shape, said housing portion being formed with a clock-receiving cavity therein, said clock-receiving cavity occupying a portion of said housing portion normally viewed by a user, said housing portion being further formed with an annular clip receiving cavity which communicates coaxially with respect to said clock-receiving cavity, said housing portion being yet further formed with a pair of fastener openings through a rearward side thereof and each communicating with said clip receiving cavity, said housing portion being yet further formed with a pair of indentations proximate said clock-receiving cavity for accommodating the fingers of a user wishing to remove the contents of said clock-receiving cavity; a plurality of spring clips disclosed within said clip receiving cavity; a clock mechanism disposed and held within said clock-receiving cavity by means of said spring clips; and fasteners extending through said fastener openings for removably holding said spring clips.

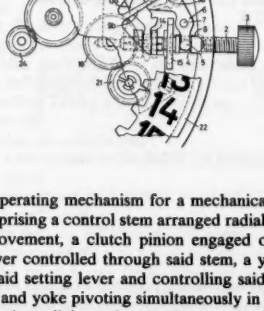


4,112,673

OPERATING MECHANISM FOR MECHANICAL WATCH MOVEMENT

Beat Gilomen, Lengnau, Switzerland, assignor to A. Schild S.A., Grenchen, Switzerland

Filed Mar. 11, 1977, Ser. No. 776,617
Claims priority, application Switzerland, Mar. 18, 1976, 3422/76
Int. Cl.[2] G04B *19/24, 27/02*
U.S. Cl. 58—85.5 **8 Claims**



1. An operating mechanism for a mechanical watch movement comprising a control stem arranged radially with respect to said movement, a clutch pinion engaged on said stem, a setting lever controlled through said stem, a yoke controlled through said setting lever and controlling said clutch pinion, said lever and yoke pivoting simultaneously in opposite directions around parallel axes in response to a displacement of the stem, a pivoting lever controlled through said yoke and having a hand setting wheel pivotally mounted thereon, means for maintaining said pivoting lever in an abutting position when it is not controlled through said yoke, and a guard plate provided with a linear elastic arm which acts as setting-lever spring and has a spring head at its free end, said head having a front edge and a rear edge and the setting lever being equipped with a pin which cooperates with one of the edges of the head so as to fix the mechanism in several different positions, the front edge and the rear edge of the head of the setting-lever spring both having at their ends two opposite ramps arranged so as to be able

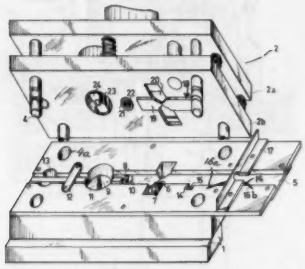
to cooperate with the pin in order to fix the mechanism in two extreme positions.

4,112,674

MACHINERY FOR THE MASS PRODUCTION OF PRONGED MEMBERS OR OF CONTINUOUS STRIPS OF PRONGED MEMBERS

Amedee Fesquet, 12380 Saint-Sernin-sur-Rance, France

Filed May 19, 1977, Ser. No. 798,356
Claims priority, application France, May 20, 1976, 76 15598
Int. Cl.² B21Q *7/02*; B21D *53/46*
U.S. Cl. 59—72 **5 Claims**



1. Machinery for the mass production of rigid pronged members having a solid head and at least one pointed prong comprising first and second dies adapted to be assembled facing each other on a stamping press and to be brought sequentially into pressing contact with each other, the first die having a longitudinal groove and having, successively along the length of the groove, an inlet section for guiding a strip of metal, a cutting section composed of a stamp cutting die piece with an opening for scrap removal for cutting the strip into successive blanks composed of a head with at least one laterally projecting prong, a die stamping section composed of at least one die stamping finger protruding from a cavity provided in the first die toward the groove and finally an outlet section where the bottom of the groove has at least one slot for guiding the respective prongs; and said second die having opposite the above-mentioned cutting section, a counterpiece with movable cutting punch corresponding to the shape of said cutting die piece and, opposite the die stamping section, at least one movable punch positioned opposite each die stamping finger for shaping said head and at least one hollow punch surrounding said movable punch for bending the prong or prongs to a position out of the plane of the metal strip.

4,112,675

APPARATUS AND METHOD FOR STARTING A LARGE GAS TURBINE HAVING A CATALYTIC COMBUSTOR

Paul W. Pillsbury, Wallingford, and Serafino M. DeCorso, Media, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 613,842, Sep. 16, 1975, abandoned. This application Sep. 30, 1976, Ser. No. 728,334
Int. Cl.² F02C *7/26*
U.S. Cl. 60—39.06 **7 Claims**

1. A method of starting continuous catalytic supported combustion in a gas turbine engine having a main compressor and a turbine in fluid flow communication through a fixed geometry combustion chamber housing the catalytic reactor element therein, said method comprising:

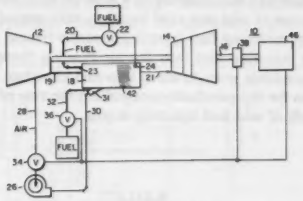
rotating the shaft of said main compressor from an external power source to initiate at least some flow from said main compressor to said turbine through said catalytic reactor element;

delivering compressed air from a supplemental compressor to a flame holding combustion zone out of the path but in flow communication with the main flow through said combustion chamber upstream of said catalytic reactor element;

delivering fuel for mixture with said air in said flame holding zone;

igniting said air/fuel mixture in said flame holding zone for self-sustaining continuous combustion therein;

passing the hot gases of combustion in said zone into the main path of said combustion chamber for flow through said catalytic reactor element to heat said element;



monitoring the temperature of said element and upon said element attaining an auto-combustion temperature therein, initiating main fuel delivery into the main flow of said combustion chamber upstream of said catalytic reactor element for combustion of said main fuel therewithin; and

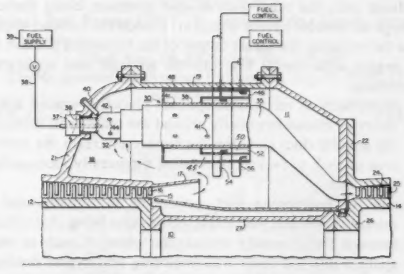
subsequently terminating the delivery of fuel and air to said flame holding combustion zone to extinguish combustion upstream of said cataytic reactor element and regulating the supply of main fuel into said combustion chamber in accordance with the load on said engine.

4,112,676

HYBRID COMBUSTOR WITH STAGED INJECTION OF PRE-MIXED FUEL

Serafino M. DeCorso, Upper Providence Township, Delaware County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 5, 1977, Ser. No. 784,754
Int. Cl.² F02C *7/22*
U.S. Cl. 60—39.71 **6 Claims**



1. A combustion apparatus for a gas turbine engine comprising: a combustion chamber having, in the direction of fluid flow therethrough, a head end, an intermediate portion, and a discharge end; a first fuel injecting means for discharging fuel into said head end; air inlet means in said head end providing combustion air for said fuel; ignition means for igniting said fuel/air mixture in said head end for diffusion burning; and, means for introducing pre-mixed fuel and air into said chamber downstream of said diffusion burning, said last-named means comprising:

a first duct means having an open inlet end for receiving compressed air and providing confined flow communication therefrom to within the intermediate portion of said combustion chamber at one axial location thereof, said first duct generally enclosing fuel injecting means adjacent its open end for injecting fuel into the air flowing therethrough for pre-mixing prior to entry into said combustion chamber;

at least a second duct means having an open inlet end for receiving compressed air and providing confined fluid flow communication therefrom to within the intermediate portion of said chamber at a separate axial location downstream of said one axial location, said second duct generally enclosing fuel injecting means adjacent its open end for injecting fuel into the air flowing therethrough for pre-mixing prior to entry into said chamber; and,

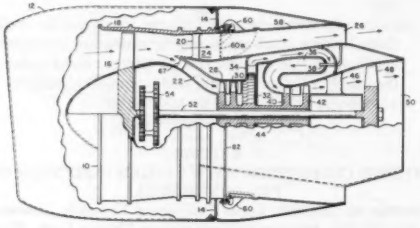
means for independently controlling the rate of fuel flow to each of said fuel injecting means.

4,112,677

THRUST SPOILER FOR TURBOFAN ENGINE

Joseph R. Kasmarik, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Jan. 31, 1977, Ser. No. 763,770
Int. Cl.[2] F02K 3/06
U.S. Cl. 60—226 R **7 Claims**



1. In a turbofan engine having a driven fan rotating in an annular duct which is a continuation of the engine air intake, said fan providing an airstream which is divided, one part of said airstream being fed to the engine compressor of the gas producer unit, the other part of said airstream being ducted through an annular bypass which surrounds the turbine, apparatus for reducing the thrust output of the bypassing portion of the engine airstream at low throttle settings, said apparatus comprising:

a multiplicity of retractable spoilers placed at spaced apart intervals circumferentially around the outer wall forming the annular duct carrying the bypass airstream the active area of each of said spoilers being a generally rectangular plate; and

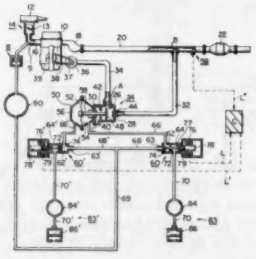
means for positioning said spoilers to an actuated and a retracted position, said retracted position being that which recesses the generally rectangular plate of each of said spoilers into the outer wall enclosing said bypass ducting allowing air to freely flow therethrough when the spoilers are retracted, said actuated position being that which deploys said spoilers into the bypass air passage, said deployment being such that the forward facing side of each generally rectangular plate portion of each of said spoilers lies in a plane which is perpendicular to the axial centerline of said gas producer section; the deployment of said spaced apart spoilers being for the purpose of both partially blocking airflow in the bypass air passageway and at the same time creating turbulent air flow conditions within the passageway.

4,112,678

SYSTEM FOR INTRODUCING SECONDARY AIR INTO AN INTERNAL COMBUSTION ENGINE

Hideo Miyagi, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 1, 1976, Ser. No. 737,667
Claims priority, application Japan, Jun. 18, 1976, 51/70965
Int. Cl.[2] F01N 3/10
U.S. Cl. 60—276 **5 Claims**



1. A system for introducing secondary air into an exhaust system of an internal combustion engine provided with a three-way catalytic converter in its exhaust system, which comprises:

a source of secondary air, a flow control valve between said source and said converter, said valve having a first control chamber and a second control chamber;

a vacuum signal port in the engine intake system,

a first vacuum signal switching valve and a second vacuum signal switching valve, means connecting each of said switching valves to the corresponding control chamber of said flow control valve, each of said switching valves having a first position in which the corresponding control chamber is opened to said vacuum signal port, and a second position in which the corresponding control chamber is opened to atmosphere;

a sensor for sensing and signaling the air-combustion products ratio in the exhaust system;

an operating unit for switching said first and second vacuum signal switching valves in accordance with the signals from said sensor in such a manner that said first vacuum signal switching valve is switched to its first position and said second vacuum signal switching valve is switched to its second position when there is an excess air being fed to the converter to transmit the vacuum signal from said vacuum port into said first control chamber of said flow control valve in order to move the valve member thereof in one direction allowing the amount of the secondary air to be decreased, and in such a manner that said first vacuum signal switching valve is switched to its second position and said second vacuum signal switching valve is switched to its first position when lack of air reaches a predetermined value to transmit the vacuum signal into the second control chamber in order to move the valve member in another direction opposite to said one direction allowing the amount of secondary air to be increased, and;

means for causing a quick movement of said valve member within a limited distance in each of said directions at the moment when said switching operation of the first and second vacuum signal switching valves is carried out, so that said excess air ratio λ is rapidly controlled to be near 1.0, which is suitable for the operation of the three way catalytic converter.

4,112,679

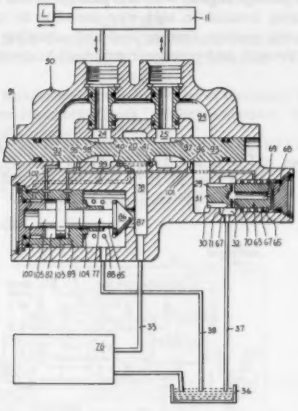
LOAD RESPONSIVE FLUID CONTROL VALVES

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Division of Ser. No. 522,324, Nov. 8, 1974, Pat. No. 3,998,134, which is a continuation-in-part of Ser. No. 377,044, Jul. 6, 1973, Pat. No. 3,882,896. This application Dec. 6, 1976, Ser. No. 731,367

Int. Cl.[2] F16H *39/46*

U.S. Cl. 60—445 7 Claims



1. A load responsive control system comprising a combination of

(a) a variable delivery fluid pump;

(b) a discharge pressure compensator for varying pump delivery rate in inverse relation to discharge pressure to thereby limit that pressure to a predetermined maximum value;

(c) a fluid pressure motor connected to a load;

(d) a fluid reservoir;

(e) fluid distributing means for selectively directing discharge fluid from the pump to the motor and exhaust fluid from the motor to the reservoir;

(f) resistance means to vary resistance to fluid flow from the motor to the reservoir;

(g) control means responsive to said resistance means to vary pump delivery rate in inverse relation to said resistnce to maintain said resistance at a first constant preselected value when discharge pressure of said pump is below said predetermined maximum value.

4,112,680

CONTROL SYSTEMS AND ARRANGEMENTS FOR MINERAL MINING INSTALLATIONS

Hans Theodor Grisebach, Unna, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

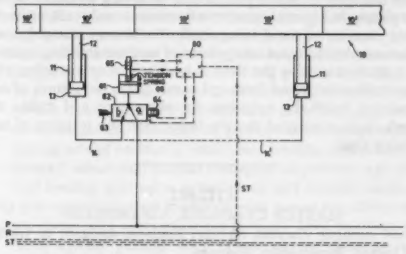
Continuation-in-part of Ser. No. 632,191, Nov. 17, 1975, Pat. No. 4,046,058, which is a division of Ser. No. 423,483, Dec. 10, 1973, Pat. No. 3,965,797. This application Feb. 7, 1977, Ser. No. 766,069

The portion of the term of this patent subsequent to Jun. 29, 1993, has been disclaimed.

Int. Cl.[2] F15B *7/02*

U.S. Cl. 60—538 12 Claims

1. In a mineral mining installation with a plurality of shifting rams arranged in a mine working and serving to displace mining apparatus through a predetermined distance, each shifting ram having a working chamber which is charged with pressure fluid to extend the shifting ram; an improved control system for operating the shifting rams and effecting fine control of the displacement of the mining apparatus, said system comprising: pressure fluid supply means for supplying pressure fluid used for operating the shifting rams; and a plurality of fluid-apportioning devices each allocated to at least one of the shifting rams, each apportioning device including a piston and cylinder unit having a piston and having a single working chamber located solely on one side of the piston, mechanical means for biasing the piston in the direction which increases the volume of the single working chamber, automatic means for alternately and cyclically connecting the pressure fluid supply means to the single working chamber of the piston and cylinder unit, and connecting the working chamber of the at least one shifting ram solely to the single working chamber of the piston and cylinder unit, means for cyclically operating the



piston of the piston and cylinder unit to alternately permit the single working chamber of the piston and cylinder unit to be charged with pressure fluid and to expel the pressure fluid to the working chamber of the associated shifting ram in predetermined non-variable quantities in successive doses, each dose corresponding to the expelling displacement of the piston of the piston and cylinder unit and to a single connecting cycle of the connecting means, and means for generating and transmitting separate control signals for causing the operating means and the connecting means to cooperatively transfer a succession of fluid doses to the associated shifting ram, thereby moving the mining apparatus through a fraction of the predetermined distance.

4,112,681

HYDRAULIC COUPLING AND SPEED MULTIPLYING MECHANISM

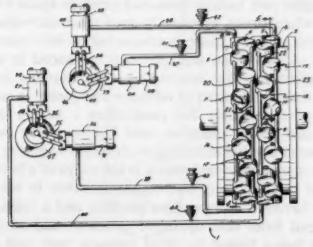
Rafael Tuti Roces, 1646-C F. Agoncillo St., Ermita, Manila, Philippines

Filed Aug. 18, 1976, Ser. No. 715,625

Claims priority, application Philippines, Sep. 5, 1975, 17545

Int. Cl.[2] F15B *7/02*

U.S. Cl. 60—539 2 Claims



1. A hydraulic coupling and speed multiplying mechanism for transmitting rotary motion from a driving shaft to a driven shaft comprising an annular cylinder block, said annular cylinder block having therein several laterally spaced apart circu-

larly arranged rows of radially disposed pressure transmitting cylinders, the pressure transmitting cylinder in each circular row, being uniformly spaced apart angularly and staggeredly arranged relative to each of the transmitting cylinders in the other circumferential rows; corresponding pistons operatively disposed in all said pressure transmitting cylinders; an interconnected cylinder head assembly secured to said annular cylinder block to cover the pressure transmitting cylinders in each circular row, a cam assembly with a driving shaft disposed within said cylinder block to actuate the pistons in each circular row simultaneously and sequentially relative to the pistons in said other circular rows, receiving hydraulic cylinders, operatively connected by corresponding pipe lines to said circular rows of pressure transmitting cylinders, each said receiving hydraulic cylinders having a corresponding piston with linkages, at least a pair of said receiving hydraulic cylinder pistons being connected to a common crankshaft, whereby upon rotation of the driving shaft of said cam assembly, said cam assembly actuates said pistons of said transmitting hydraulic cylinders causing the fluid in each said corresponding pipe lines to flow back and forth and causing also the pistons of said receiving hydraulic cylinders to reciprocate and rotate the crank shaft connected thereto faster than the rotation of said driving shaft.

4,112,682

MASTER CYLINDER ASSEMBLIES

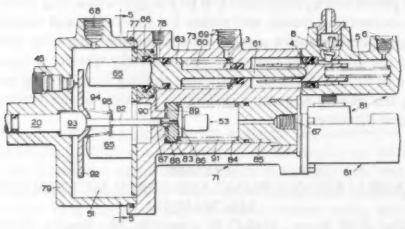
David Anthony Harries, Shirley, England, assignor to Girling Limited, Birmingham, England

Division of Ser. No. 424,886, Dec. 14, 1973, Pat. No. 3,994,535. This application Apr. 5, 1976, Ser. No. 674,058

Claims priority, application United Kingdom, Jul. 25, 1973, 35393/73

Int. Cl.² B60T *13/12*

U.S. Cl. 60—548 **2 Claims**



1. A power-operated hydraulic master cylinder assembly for a vehicle hydraulic braking system comprising a housing having a bore, a piston adapted to be advanced in said bore to generate fluid pressure in a pressure space defined in the bore at a position in advance of said piston, said housing also incorporating an inlet port for connection to a reservoir for fluid, and an outlet port leading from said pressure space for connection to a wheel brake, a normally open reservoir valve through which said pressure space is connected to said inlet port and which is closed when said piston is advanced in said bore, means defining in said housing a power chamber into which pressure fluid is admitted to advance said piston in said bore, a booster-valve assembly for controlling a supply of booster fluid to said power chamber, said booster-valve including a pedal-operated valve actuating member for applying an applying force manually to said piston in the event of a failure in said supply of booster fluid, and a stop member in said housing movable between an operative position and a retracted position spaced from said operative position, said stop member normally being biased by fluid pressure into said operative position to prevent said pedal-operated member from being advanced through a distance sufficient to transmit a force to said piston, and a reduction in pressure in said power chamber reducing the effective pressure acting on said stop member to allow said stop member to move into said retracted position in response to an applying force applied to said pedal-operated valve actuating member and transmitted to said piston, wherein said housing also includes a blind bore in which said stop member is located, said stop member includes a valve face, and a wall in said housing between said power chamber and said blind bore has a seating face which is engaged by said valve face when said stop member is in said operative position, said wall having a passage providing a connection between said blind bore and said power chamber, and said stop member having a passage aligned with said passage in said wall, an inlet valve being located in said stop member to control flow through said passage therein, and said actuating member extending through said passage in said wall to operate said inlet valve.

4,112,683

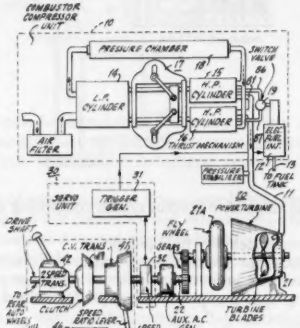
CONTROLLED PULSE TURBINE ENGINE

Leon Bess, 433 B. S. 2nd Ave., Highland Park, N.J. 08904

Filed Jun. 20, 1977, Ser. No. 807,988

Int. Cl.² F02B *71/06*; F02D *39/10*

U.S. Cl. 60—595 **7 Claims**



1. A controlled pulse turbine engine, comprising:

(a) turbine means having a shaft rotatably coupled thereto for supplying power to a load, said turbine means driven by a nozzle adapted to receive compressed gas for rotation of said turbine and hence, said shaft,

(b) a combustor-compressor means having a piston assembly adapted to move in a relatively linear path, said piston assembly comprising first and second high pressure cylinders, each having a separate actuatable piston, a crosspiece block, means coupling each of said pistons to said crosspiece block, a low pressure cylinder having a actuatable piston capable of moving upon application thereto of a substantially lower pressure than that accommodated by said high pressure cylinders and upon moving to cause a charge of air to be conducted from the atmosphere into said low pressure cylinder, said piston coupled to said crosspiece block by means of at least one piston rod, and thrust counter-force means coupled to said crosspiece block for maintaining equilibrium of said piston assembly, while constraining said assembly to move in said linear path,

(c) servo means operative to monitor the rotation of said turbine and operative to develop a signal for activating either one of said high pressure cylinders to move said two high pressure pistons, said low pressure piston as coupled thereto and said crosspiece block in a linear path,

(d) exhaust means coupled to said high pressure cylinders to provide a series of pulses at an output, each pulse in said

series manifesting a charge of hot compressed gas indicative of always the same fuel charge generated by the motion of said high pressure pistons within said associated cylinder,

(e) means for applying said pulse series to said turbine nozzle for rotation of said shaft, and

(f) means for conducting compressed air charges emitted from said low pressure cylinder into either of said high pressure cylinders.

4,112,684

MULTIPLE WORKING CHAMBER FORMING COMBUSTION MACHINE WITH EXHAUST TURBO CHARGER

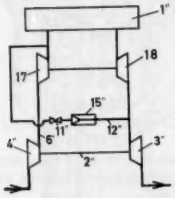
Paul Tholen, Bensberg-Refrath, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Jun. 22, 1976, Ser. No. 698,312

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1975, 2527871

Int. Cl.² F02B *37/00*

U.S. Cl. 60—606 **1 Claim**



1. In combination, an internal combustion engine forming multiple working chambers, a multi-stage exhaust gas turbocharger having high and low pressure compressor and turbine stages, and a controllable bypass line between the pressure side of the high pressure compressor stage and the exhaust gas system wherein the bypass line empties into a zone of low pressure, between the high and low pressure turbine stages, the pressure of compresed air being higher than exhaust gas pressure when the bypass line branches off behind the high pressure stage of the compressor and before the low pressure stage of the turbine.

4,112,685

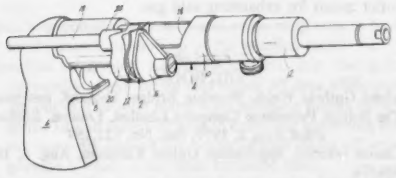
LOADING DEVICE FOR A POWER ACTUATED TOOL

Marc Combette, 116 rue des Moulins, and Jean Ollivier, 89 avenue des Beaumes, both of Valence, France (26000)

Filed Nov. 29, 1976, Ser. No. 745,747

Int. Cl.² F01B *29/08;* F02N *13/00*

U.S. Cl. 60—634 **9 Claims**



1. In a power-actuated tool of the type having a housing with a loading port through which a power charge can be loaded into the tool, the tool also having a barrel assembly slidable in the housing between a rearward firing position and a forward loading position and return, the barrel having opening through its rearward end a firing chamber for reception of a power charge, an improved loading assembly comprising:

(a) support means fixedly secured to an outer surface of said tool housing, said support means being adapted to releasably support a container of stacked power charges, and said support means having a through bore sized to permit free passage of the power charges from the container thereof through at least a portion of said support means;

(b) transfer means movably mounted on the exterior of said tool housing, said transfer means being movable between a charge-receiving position and a charge-loading position and return, said transfer means being provided with a bore, open at both ends, for receiving ones of the power charges to transport the latter from the support means to the tool firing chamber, said transfer means bore being coaxial with said support means through bore when said transfer means is in said charge-receiving position, and said transfer means bore being coaxial with said tool firing chamber when said transfer means is in said charge-loading position, said transfer means bore having an axial dimension which is only slightly longer than the axial length of a power charge and having a diameter which is larger than the diameter of a power charge to permit the power charge to slide through said transfer means bore solely under the influence of gravity, said transfer means having an end portion in which said transfer means bore is located, which end portion is adapted to pass through said tool loading port upon actuation of said transfer means;

(c) first means adjacent to said support means for selectively overlying said support means through bore to close the latter against passage of a power charge therethrough when said transfer means is not in said first position;

(d) second means adjacent to said transfer means for overlying said transfer means bore until said transfer means is in said second charge-loading position; and

(e) locating means on said transfer means for stopping movement of said transfer means in each of said first and second positions to ensure proper positioning of said transfer means bore.

4,112,686

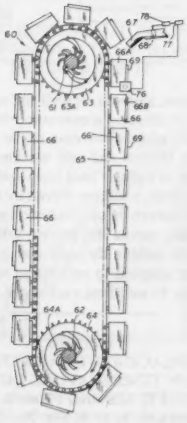
METHOD AND APPARATUS FOR HARNESSING THE POWER OF MOVING WATER

Robert Trotta, 2954 West 8th St., Brooklyn, N.Y. 11224

Division of Ser. No. 627,237, Oct. 30, 1975, Pat. No. 4,052,856. This application Aug. 4, 1977, Ser. No. 821,639

Int. Cl.² F03B *7/00, 9/00*

U.S. Cl. 60—639 **5 Claims**



1. A system for harnessing the power of moving water for producing useful work comprising:

a pair of spaced apart shafts,

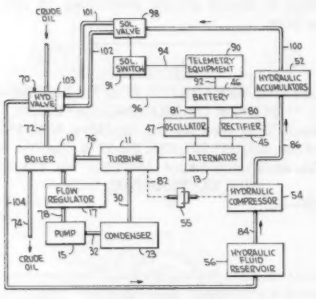
rotary means journalled on said shafts for effecting the drive thereof,
an endless flexible drive means threaded over said rotary means for effecting the drive thereof,
a plurality of containers connected to said flexible drive at spaced intervals therealong,
said containers having an open upper end portion,
means for successively filling each of said containers with water whereby the weight of water in said containers effects the drive of said flexible drive and associated rotary means,
said containers being emptied as they round one of said rotary means,
and control means for controlling the flow of water to successively fill each of said containers with a predetermined amount of water in accordance with the demand for power and the speed of said system, wherein said control means includes a valve means for controlling the flow of water of a water supply,
acutating means operatively connected to said valve means for operating said valve means between an operative and inoperative position,
and means connected to said container for energizing said actuating means when said container has reached a predetermined filling position.

4,112,687

POWER SOURCE FOR SUBSEA OIL WELLS

William Paul Dixon, 22811 Fincastle Dr., Katy, Tex. 77450

Filed Sep. 16, 1975, Ser. No. 613,744
Int. Cl.[2] F03G *7/02*
U.S. Cl. 60—641 **8 Claims**



1. In combination, a subsea oil well and means for generating electrical power in situ, said means comprising a working fluid, a heat exchanger adapted to pass crude oil from said well through one side thereof and said working fluid through the other side thereof to transfer heat from said oil to said working fluid to heat said fluid, a turbine driven by said heated working fluid, a generator driven by said turbine, a condenser cooled by ambient sea water, means for passing said working fluid exhausted from said turbine through said condenser to cool it, and a compressor adapted to return said working fluid cooled by said condenser to said heat exchanger.

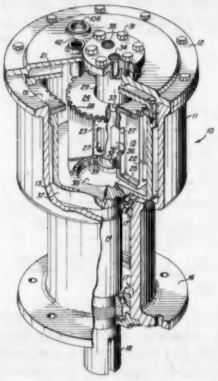
4,112,688

POSITIVE DISPLACEMENT GAS EXPANSION ENGINE WITH LOW TEMPERATURE DIFFERENTIAL

John B. Shaw, 1812 E. Marlette, Phoenix, Ariz. 85016

Filed Oct. 8, 1976, Ser. No. 731,009
Int. Cl.[2] F01K *11/00*
U.S. Cl. 60—669 **28 Claims**

1. A device comprising:
a housing,
a first shaft journaled for rotation in said housing and having provisions for a power connection at one end thereof,
the other end of said first shaft forming a hollow cylinder arranged within said housing,
a ducted second shaft affixed to said housing for extending into said cylinder,
a multi-cavity rotor arranged within said cylinder and journaled on said second shaft,
the longitudinal axis of rotation of said rotor being offset from and parallel with the axis of rotation of said cylinder,
said rotor comprising a hollow cylindrical core having a plurality of spacedly radially positioned vanes arranged around said core forming a plurality of cavities one arranged between every pair of said vanes,
fixed heat exchange means positioned within said rotor cavities for transferring heat retained thereby,
coupling means arranged between said rotor and said cylinder for causing one to rotate the other,



a plurality of openings radially formed around said core each providing a slot from the hollow interior of said core into a different one of each of said cavities,
said second shaft being provided with a plurality of ports extending from its ducted interior through its outer periphery for sequential alignment with some of the openings in said core,
whereby when liquid is placed within said cylinder and at least in some of said cavities of said rotor, a centrifugally disposed sealing means is provided between the inside of said cylinder and said cavities of said rotor upon rotation thereof,
inlet means for conducting a gas through said core and thence sequentially through said openings and into said cavities where a differential rotation force is manifested, and
outlet means for exhausting said gas.

4,112,689

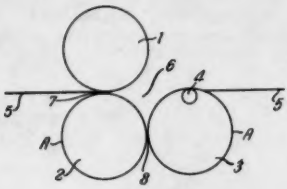
OIL BOOM

Michael Guthrie Webb, Wootton Bridge, England, assignor to The British Petroleum Company Limited, London, England

Filed Aug. 2, 1977, Ser. No. 821,159
Claims priority, application United Kingdom, Aug. 6, 1976, 32804/76
Int. Cl.[2] E02B *15/04*
U.S. Cl. 405—63 **11 Claims**

1. A barrier for the containment and recovery of oil spilt on water comprising at least one elongated, flexible buoyant chamber, at least one elongated, flexible ballast water chamber and at least one further flexible water chamber of greater buoyancy than the ballast chamber, the buoyant chamber and the further water chamber each being joined to the ballast

water chamber in side by side relationship and the chambers being so positioned relative to one another that when in use on water the buoyant chamber and the ballast water chamber



together form a barrier for oil spilt on water and the further water chamber defines a weir between itself and the other chambers, said weir being provided with means to remove oil and water therefrom.

4,112,690

METHOD AND CONSTRUCTION OF UNDERGROUND TANK WELL

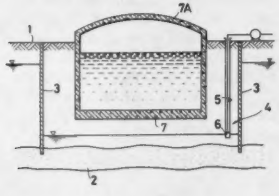
Kazuo Hosoya, Tokyo, and Munetaka Kubota, Hino, both of Japan, assignors to Kajima Kensetsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1976, Ser. No. 741,679

Claims priority, application Japan, Nov. 22, 1975, 50-140458; Nov. 22, 1975, 50-140459

Int. Cl.[2] B65G *5/00*; E02D *31/02*

U.S. Cl. 405—57 **3 Claims**



1. The method of constructing an underground tank in water permeated soil, comprising the steps of:

sealing off an excavation area to reduce ground water seepage;

installing pumping means in said excavating area to be at a level beneath the bottom of the installed tank;

insertion of ground hardening material into the ground outwardly of and below said sealed off area while pumping out said ground water with pumping means from the center of said sealed off area to draw said hardening material inwardly toward the center of said sealed off area to provide a water impervious hardened base;

excavating said area above said water impervious hardened base sufficient to receive a tank therein;

installing said tank in said excavated area above said water impervious hardened base;

back filling around said tank;

leaving said pumping means in place and operable to remove water seepage from the back fill around said tank after underground installation thereof.

4,112,691

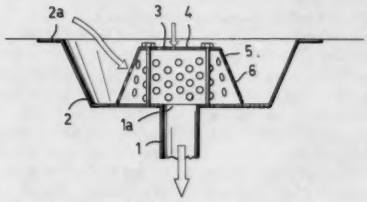
RAIN WATER ROOF OUTLET OR SIMILAR FOR A BUILDING

Martti Olavi Aladar Ebeling, and Risto Waldemar Lundén, both of Helsinki, Finland, assignors to Kontekla Oy., Helsinki, Finland

Filed Jun. 20, 1977, Ser. No. 808,348

Int. Cl.[2] E02B *5/08, 9/04*

U.S. Cl. 405—119 **1 Claim**



1. A rain water roof outlet for a building, comprising a vertical pipe having a mouth at its upper end, said pipe leading from a roof or some other collecting area, a trough connected to and in communication with the upper end of said pipe, said trough being wider than the mouth of said pipe and having the free upper edge located at a higher level than the mouth of the vertical pipe, and a lid fastened above the mouth so as to leave a space between the lid and the mouth through which water can flow from the trough into the mouth, said lid being wider than the mouth but smaller than the trough and the lower edge thereof being located at a lower level than the upper edge of the trough so that the lid prevents the formation of an air whirl in the vertical pipe when the trough is filled with water, characterized in that the lid portion located above the mouth of the vertical pipe is provided with a perforation the total area of which is so small, maximum 15 percent of the cross-sectional area of the vertical pipe, that the formation of an air whirl in the vertical pipe is prevented in spite of the air entering the mouth through said perforation.

4,112,692

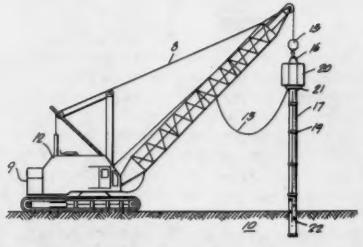
SOIL COMPACTION SYSTEM

Lowell M. Anderson, 5422 Panorama Dr., Huntsville, Ala. 35801, and William D. Simmons, 1216 Seventh St., Long Beach, Miss. 39560

Division of Ser. No. 24,207, Mar. 31, 1970, abandoned. This application Jun. 20, 1977, Ser. No. 808,299

Int. Cl.[2] E02D *3/12*

U.S. Cl. 405—271 **20 Claims**



1. Vibratile apparatus for deep sub-surface compaction of granular soil material using continuously applied vibrational energy, comprising

(a) probe means for transmitting a wave-like harmonic vibrational motion below the surface of the granular soil material when subjected to the continuously applied vibra-

tional energy, said probe means including an elongated thin-walled member having opposed lateral surfaces separated only by the wall thickness of said elongated thin-walled member and having a substantially uniform cross-sectional shape perpendicular to its longitudinal axis, said elongated thin-walled member being shaped for insertion endwise into the granular soil material to cause both said opposed lateral surfaces to contact directly and transmit vibrational energy into the granular soil material to cause compaction of the granular soil material on both sides of said elongated thinwalled member; and

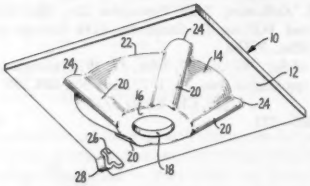
(b) vibration increasing means attached to one of said lateral surfaces of said elongated thin-walled member for increasing the amount of vibrational energy conveyed into the granular soil material adjacent said one lateral surface while the other said lateral surface of said thin-walled member is still in contact with the granular soil material, said vibration increasing means including at least one continuous raised lateral projection extending outwardly across the full horizontal extent of said one lateral surface when said probe means is inserted into the granular material.

4,112,693

MINE ROOF SUPPORT PLATE

Alvaro L. Collin, Orinda, and Gordhan M. Patel, Cerritos, both of Calif., assignors to Kaiser Steel Corporation, Oakland, Calif.

Filed Sep. 30, 1976, Ser. No. 728,254
Int. Cl.[2] E21D *21/00*; F16B *29/00*
U.S. Cl. 405—132 **6 Claims**



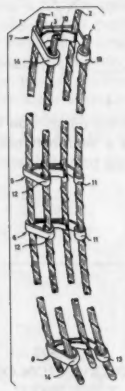
1. A mine roof support plate having a rigid sheet steel body of generally uniform thickness, said body having outer and inner sides and comprising: a generally planar peripheral section; a domed section extending outwardly from, and surrounded by, the planar section, said domed section intersecting the peripheral section to define a distinct fillet extending around the domed section and merging with the peripheral section; a central section at the outer extremity of the domed section, said central section having a bolt hole extending therethrough and defining a generally flat bearing area extending around said hole and disposed in parallel spaced relationship to the peripheral section; and a plurality of ribs formed in the domed section so as to extend radially from the central section in angularly spaced relationship to one another, said ribs protruding from the domed section and merging at the distal ends thereof with the peripheral section to define radial extensions of the fillet between the domed and peripheral sections.

4,112,694

TUNNEL-LAGGING ELEMENT AND SYSTEM

Rudolf Gruber, Millstatt am See, Austria, assignor to GD Anker Gebirgs-Dübel-Anker GmbH & Co. KG, Millstatt am See, Austria

Filed May 5, 1977, Ser. No. 794,317
Claims priority, application Austria, May 7, 1976, 3362/76
Int. Cl.[2] E21D *11/14, 11/18*
U.S. Cl. 405—150 **8 Claims**



1. A tunnel-lagging element for embedding in a concrete tunnel lining, comprises:

a first pair of mutually parallel transversely spaced curved rods adapted to lie relatively proximal to a tunnel wall;

a second pair of transversely spaced mutually parallel curved rods spaced from said first pair of rods and relatively distal from said wall;

first means at the central third of the length of the elements for securing all of said rods in spaced-apart relation without relative freedom of longitudinal movement; and

respective second means toward each end of the element for retaining said rods in spaced-apart relation while permitting longitudinal displacement of said first pair of rods relative to said second pair of rods each of said second means securing the rods of said first pair against longitudinal displacement relative to one another.

4,112,695

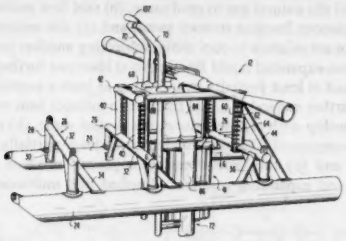
SEA SLED FOR ENTRENCHING PIPE

Nuke Ming Chang; Elmer R. Remkes, both of Orange, Calif., and William Cook, Jr., Houma, La., assignors to Santa Fe International Corp., Orange, Calif.

Filed Feb. 28, 1977, Ser. No. 773,015
Int. Cl.[2] E02F *5/02*; F16L *1/00*
U.S. Cl. 405—163 **63 Claims**

1. Apparatus for use in making a trench in a sea bottom and for removing spoil formed during making such a trench, said apparatus including: at least one suction tube having a bent portion merging with an eductor tube section; a jet pump associated with said suction tube and comprising first and second nozzles which are arranged substantially coaxially in tandem, the first nozzle projecting through a side of said suction tube into the bent portion in the direction of the outlet of the eductor tube section, the second nozzle having an outlet end located within and radially spaced from an inlet section of the first nozzle such that said first nozzle is intended to be in communication with ambient water during a trenching operation, and means for supplying high pressure water to said second nozzle to cause said water supply to flow through said

nozzles to entrain ambient water and to cause spoil produced during the trenching operation to flow through the suction



tube to be entrained with said water supply and ambient water and discharged through the eductor tube section.

4,112,696

DRIVE SHIELD

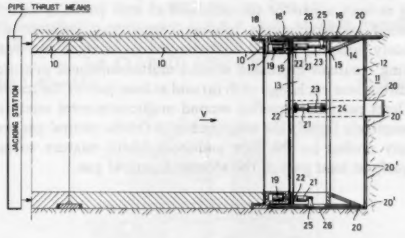
Hans Jutte, Kamphecke 13, and Helmut Weber, Spannerweg 16, both of 4600 Dortmund, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,813

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617782

Int. Cl.[2] E01G *3/02*

U.S. Cl. 405—145 **15 Claims**



1. A drive shield for use in a tunnelling operation, the drive shield comprising:

(a) a generally cylindrical cutting shield having a cutting edge supported by a frame,

(b) a generally cylindrical knife shield surrounding the cutting shield,

(c) said knife shield having a plurality of elongate members each of which is extensible relative to the cutting edge in the direction of tunnel advance, wherein the knife shield and the cutting edge are telescoped together,

(d) each elongate member is provided with a respective device for extending that elongate member relative to the cutting shield,

(e) each said extending device is constituted by a hydraulic ram which acts between the cutting shield and a respective elongate member,

(f) said hydraulic rams are arranged within the cutting shield, and

(g) a respective coupling element connects each hydraulic ram to the corresponding elongate member,

(h) each respective coupling element extends through a respective aperture in the cutting shield.

4,112,697

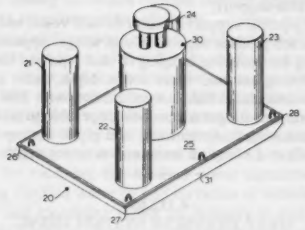
METHOD OF PRODUCING AND INSTALLING OFFSHORE STRUCTURES

Philip Y. Chow, Orinda, Calif., assignor to Lin Offshore Engineering, Inc., San Francisco, Calif.

Division of Ser. No. 574,110, May 2, 1975, Pat. No. 4,015,554. This application Dec. 13, 1976, Ser. No. 749,926

Int. Cl.[2] E02D *5/00*; F02D *23/02*

U.S. Cl. 405—209 **1 Claim**



1. A method for constructing and placing an offshore structure, comprising the steps of:

completely constructing said offshore structure in a water-floatable mode on the deck of a barge while said barge is floating in shallow water, said barge having at each corner a column stabilizer and also having ballast tanks,

locking said offshore structure to the hull of said barge during said constructing, so as to connect said offshore structure to said barge,

towing the barge with said offshore structure locked thereto to a deeper water location,

ballasting said tanks to sink said barge to a depth where the offshore structure can float freely in the water, while keeping it stable by means of said column stabilizers,

unlocking the connection between said offshore structure and said barge,

displacing the barge away from the offshore structure,

refloating the barge by deballasting said tanks and returning it to shore, and

lowering the offshore structure to its desired position.

4,112,698

ARTICULATED STINGER

Wayne F. Lammert; Dayton M. Simpson, and Ardeshir R. Desai, all of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed May 20, 1977, Ser. No. 798,814

Int. Cl.[2] B63B *35/04*; F16L *1/00*

U.S. Cl. 405—167 **12 Claims**

1. An articulated stinger apparatus connected to a floating vessel for laying the pipe along the bottom of a body of water from said vessel, said stinger apparatus comprising

a relatively long, non-articulated stinger link, said stinger link being connected at a first end to said vessel for pivotal movement in at least a vertical plane;

a buoyant stinger means having at least one relatively short, buoyant stinger element, said one buoyant element being linearly connected to a second end of said non-articulated stinger link for pivotal movement at least in the vertical plane;

each said buoyant stinger element having pipeline support

means for supporting and guiding said pipe along a pipe path leading to the bottom of the body of water;

a last pipeline support element on said vessel and a first contacted pipeline support of said stinger apparatus cooperating to support said pipe in a position disposed above, spaced from, and free of contact with said non-articulated stinger link throughout an effective wave action water depth;

said pipe receiving no contacting support between said last pipeline support element on said vessel to said first stinger apparatus support;

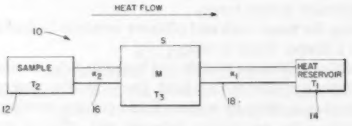
said last pipeline support element on said vessel and said first contacted pipeline support of said stinger apparatus cooperating for reducing banging of said pipe and said stinger link throughout said wave action depth; and

said non-articulated link in combination with said pipe and said buoyant stinger means being operable to position said buoyant stinger element and said pipeline support means beneath said effective wave action water depth.

4,112,699
HEAT TRANSFER SYSTEM USING THERMALLY-OPERATED, HEAT-CONDUCTING VALVES

George Elbert Hudson, III, Silver Spring, and Arthur E. Clark, Adelphi, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 4, 1977, Ser. No. 793,573
Int. Cl.[2] F25B *21/02*; F28F *27/00*
U.S. Cl. 62—3 **10 Claims**



1. A heat transfer system adapted to be coupled in heat transfer relationship between a heat reservoir and an object to be cooled or heated, said heat transfer system comprising the serial arrangement of:

a first thermal valve having a thermal conductivity which increases with decreasing temperature;

a working substance, the temperature of which may be varied by an external means;

a second thermal valve having a thermal conductivity which increases with increasing temperature; and,

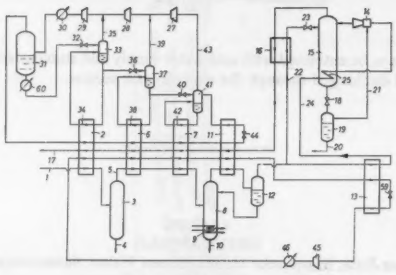
an external means to vary the temperature of said working substance.

4,112,700
LIQUEFACTION OF NATURAL GAS

Wolfgang Förg, Icking, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Jul. 18, 1975, Ser. No. 597,093
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1974, 2438443
Int. Cl.[2] F25J *3/02*
U.S. Cl. 62—28 **15 Claims**

1. In a process for the liquefaction of natural gas by heat exchange, initially with a precooling first multicomponent mixture and thereafter with a deep cooling second multicomponent mixture, each of these mixtures being in separate closed refrigeration cycles, being compressed, at least partially liquefied, and expanded, wherein the improvement comprises the first multicomponent mixture consisting essentially of by volume 8 to 20% C_2 and 92 to 80% C_3 hydrocarbons, subjecting the first multicomponent mixture, after its partial liquefaction, to a phase separation step to obtain a first miltticomponent gaseous fraction and a first multicomponent liquid fraction; expanding resultant first multicomponent liquid fraction, and at least partially evaporating at least a portion of the thus-expanded liquid fraction in indirect heat exchange relationship with (a) the natural gas to cool same, (b) said first multicomponent gaseous fraction to cool same, and (c) the second multicomponent mixture to cool same; subjecting another portion of said thus-expanded liquid fraction to at least one further expansion, and at least partially evaporating at least a portion of the thus further expanded liquid fraction in indirect heat exchange relationship with (a) the natural gas to cool same, (b) said first multicomponent gaseous fraction to at least partially liquefy same, and (c) the second multicomponent mixture to cool same; and expanding resultant liquefied first multicomponent



gaseous fraction, and at least partially evaporating resultant expanded liquefied first multicomponent gaseous fraction in indirect heat exchange with the cooled natural gas and the second multicomponent mixture, the latter being at least partially liquefied during this heat exchange, completely liquefying at least a part of the resultant at least partially liquefied second muticomponent mixture, expanding resultant completely liquefied second multicomponent mixture and evaporating resultant expanded second multicomponent mixture in indirect heat exchange with (a) said at least part of the resultant at least partially liquefied second multicomponent mixture to completely liquefy the latter and with (b) the natural gas previously cooled by the first multicomponent mixture so as to liquefy at least part of the aforesaid natural gas.

4,112,701
METHOD AND MEANS FOR COOLING THE OIL IN A SYSTEM INCLUDING A COMPRESSOR WITH OIL SUPPLY, AS WELL AS SUCH SYSTEMS

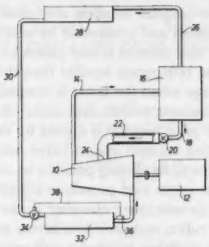
Hjalmar Schibbye, Saltsjöbaden, and Lennart Eriksson, Färentuna, both of Sweden, assignors to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Filed Sep. 29, 1976, Ser. No. 728,466
Claims priority, application United Kingdom, Sep. 29, 1975, 39768/75
Int. Cl.[2] F25B *43/02, 31/00*
U.S. Cl. 62—84 **29 Claims**

1. Method for cooling the oil in a gas compression system comprising rotary compressor with oil supply to its working space, an oil separator in the discharge line thereof and an oil supply line between the oil separator and the compressor, said gas being soluble in said oil and the solubility of the gas in the oil increases as the pressure increases, characterized by

throttling the oil in an intermediate portion of the oil supply line between the oil separator and the compressor to lower the pressure and cause refrigerant which was dissolved in said oil to boil off and form a two-phase fluid comprising gaseous refrigerant and oil having a decreased temperature; and

passing the throttled output to the compressor through the remainder of the oil supply line, the time for passing said



throttled output through said remainder of the oil supply line being between about 0.1 second and 10 seconds.

4,112,702

FREEZE DESALINATION AND CONCENTRATION APPARATUS

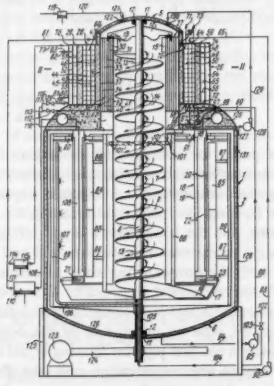
Leonard Fedorovich Smirnov, ulitsa Segedskaya, 3, kv. 37; Vladimir Mikhailovich Parkhitko, ulitsa Baranova, 28, kv. 5, both of Odessa; Valentin Ivanovich Zverkhovsky, ulitsa 28 Ijunya, 1, Moldavskaya SSR, Chimishliisky raion, poselok Bessarabka; Oleg Antonovich Burtov, ulitsa Kirova, 25; Nikolai Ivanovich Razuvaev, ulitsa Sadovaya, 27, kv. 9, both of Yalta Krymskoi oblasti; Fedor Evdokimovich Dovzhko, ulitsa Sinelnikova, 2, kv. 92, Khabarovsk; Moisha Gershovich Kleiman, pereulok Grazhdansky, 11, kv. 12, Khabarovsk, and Valentin Ivanovich Dzyan, ulitsa Panfilovtsev, 43, kv. 63, Khabarovsk, all of U.S.S.R.

Filed Jan. 3, 1977, Ser. No. 756,131

Claims priority, application U.S.S.R., Feb. 23, 1976, 2320651; Feb. 23, 1976, 2320652; Feb. 23, 1976, 2320653

Int. Cl.[2] B01D *9/04;* C02B *1/12*

U.S. Cl. 62—123 **9 Claims**



1. In a freeze desalination and concentration apparatus, starting-solution feed means and brine feed means for respectively feeding starting solution and brine, heat-exchanger means communicating with both of said feed means for receiving the starting solution and brine therefrom and for placing them in heat-exchange relationship so that the starting solution is cooled by the brine at said heat-exchanger means, discharge conduit means communicating with said-exchanger means for receiving the cooled starting solution therefrom and for discharging the same, said brine feed means also communicating with said discharge conduit means for delivering brine thereto to be mixed with said cooled solution so that said discharge conduit means discharge a mixture of brine and starting solution, ice-forming means having a surface onto which said discharge conduit means discharges said mixture to form ice from said mixture at said surface of said ice-forming means, scraper means cooperating with said surface of said ice-forming means for scraping ice therefrom, perforated wall means situated beneath said ice-forming means to receive ice which falls therefrom, ice-raising means cooperating with said wall means for raising ice which collects thereon upwardly therefrom up to a predetermined elevation, condenser means situated adjacent said ice-raising means just beneath said elevation to which the ice is raised thereby for receiving ice from said ice-raising means and for melting the ice as the latter travels through said condenser means, collecting chamber means communicating with said condenser means for receiving therefrom the melted ice in the form of distilled water, distilled water circulating means communicating with said collecting chamber for receiving the distilled water therefrom and for circulating distilled water to said elevation to which the ice is raised by said ice-raising means for delivery at said elevation both to said condenser means to flow therethrough with the ice and to said ice raising means to flow downwardly along the latter in countercurrent to the raised ice for washing the latter and forming a brine which passes through said perforated wall means, said brine-feed means receiving the latter brine which passes through said perforated wall means for feeding the latter, and said distilled water circulating means also communicating with said heat-exchanger means for delivering distilled water thereto to travel therethrough and be extracted therefrom while being placed by said heat-exchanger means also in heat exchange relationship with the starting solution, said ice-forming means having an inner refrigerant-containing space, and refrigerant circulating means communicating with the latter space for receiving the refrigerant therefrom and delivering the refrigerant in vapor form to said condenser means to travel therethrough while being condensed therein into liquid refrigerant form, said condenser means extracting from said refrigerant heat which is utilized for melting the ice delivered to said condenser means by said ice-raising means, said refrigerant circulating means receiving the condensed refrigerant from said condenser means and returning the condensed refrigerant to said space.

4,112,703

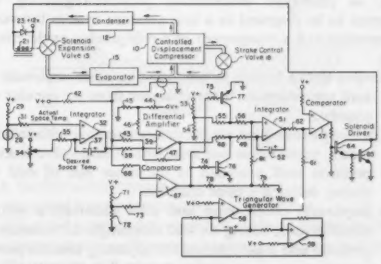
REFRIGERATION CONTROL SYSTEM

Kenneth John Kountz, Hoffman Estates, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,194

Int. Cl.[2] F25B *41/04*

U.S. Cl. 62—211 **18 Claims**



1. In a refrigeration system where refrigerant flows through a closed vapor cycle refrigeration circuit having in series an evaporator, a compressor and a condenser, a control system for controlling the operation of the refrigeration system to vary the effectiveness of the evaporator in order to maintain a

substantially constant desired temperature in a space to which cooled air is supplied by the refrigeration system, comprising:

means, including a first thermistor, for providing a space temperature electrical signal representing the actual ambient temperature in the space to be temperature controlled;

means, including a potentiometer, for providing a temperature set point electrical signal representing the desired temperature for the temperature controlled space;

means, including a second thermistor positioned adjacent to the evaporator outlet, for providing an evaporator outlet temperature electrical signal representing the actual temperature of the refrigerant at the evaporator outlet;

an electromechanical valve included in series with the refrigeration circuit between the condenser and evaporator for controlling the refrigerant flow rate through the circuit, said electromechanical valve also functioning as the expansion device in the refrigeration circuit;

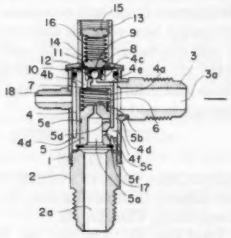
and control means responsive to said space temperature electrical signal, said temperature set point electrical signal, and said evaporator outlet temperature electrical signal for varying the actuation of said electromechanical valve to modulate the refrigerant flowing through the evaporator to adjust the refrigerant temperature at the evaporator outlet to vary the evaporator effectiveness as required to maintain the controlled space at the desired temperature.

4,112,704

PILOT VALVE-TYPE EVAPORATING PRESSURE-REGULATING VALVE USED IN REFRIGERATORS

Moriwo Kaneko, Sayama, Japan, assignor to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, Japan

Filed Mar. 8, 1977, Ser. No. 775,424
Claims priority, application Japan, Jul. 6, 1976, 51-98615[U]
Int. Cl.[2] F25B *41/04;* F16K *17/26*
U.S. Cl. 62—217 **3 Claims**



1. A pilot-type evaporating pressure-regulating valve adapted to be disposed in a low pressure system between an evaporator and a compressor of a refrigerator cycle comprising:

a valve sleeve having an outer and an inner wall, said inner wall separating an inner chamber from an annular outer chamber,

a primary connecting pipe in communication with said evaporator, provided at one axial end of said valve sleeve,

a partition wall provided at the other end of said valve sleeve, defining a pilot chamber,

a diaphragm confronting said pilot chamber, a spring of variable force acting on said diaphragm to maintain a set pressure and a mechanism for adjusting said set pressure,

a secondary connecting pipe provided in the outer wall of said regulating valve to connect said outer chamber with said compressor and a junction for an equalizing pipe, said connecting pipe also formed in said outer wall of said regulating valve,

a piston valve housed by said valve sleeve for opening and closing a passage for the refrigerant between said primary junction and said outer chamber,

a pilot passage formed in said end wall to connect said pilot chamber with said inner and outer chambers,

a pilot valve adapted to open and close said pilot passage being actuated and controlled by said diaphragm,

an equalizer hole formed in said piston valve allowing a flow rate of said refrigerant smaller than that provided by said pilot passage when the latter is opened, in order to equalize the pressures within said inner chamber across itself when said pilot passage is closed by said pilot valve, and

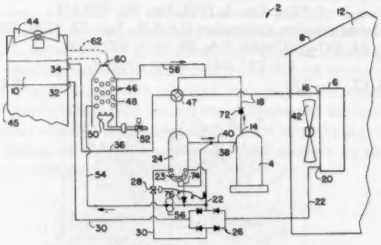
a spring acting on said piston valve adapted to move said piston valve to its closing position to close said passage for refrigerant when said pressures across said equalizer are equalized in said inner chamber in the state of closing of said pilot valve, said pressures across said equalizer within said inner chamber causing a differential, when said pilot valve is closed, to move said piston valve for opening said passage for said refrigerant.

4,112,705

FUEL FIRED SUPPLEMENTARY HEATER FOR HEAT PUMP

Francis J. Sisk, Apollo, and Stephen E. Veyo, Murrysville, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 18, 1977, Ser. No. 769,830
Int. Cl.[2] F25B *27/02, 13/00, 29/00*
U.S. Cl. 62—238 **4 Claims**

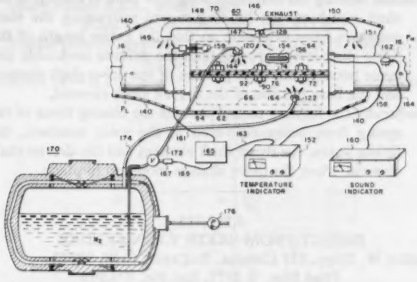


1. A heat pump for heating and cooling an indoor space comprising in combination: a refrigerant vapor compressor; a liquid refrigerant evaporator; a refrigerant vapor condensor; conduits for flowing the refrigerant between the compressor, the evaporator, and the condenser; a liquid refrigerant vaporizer including a refrigerant vaporization coil and a burner for heating the coil, the burner being sized to evaporate a given amount of liquid refrigerant received by the vaporization coil from the condenser; a first pipe connecting an intake side of the vaporization coil with an outlet side of the condenser; flow inducing means in the first pipe for flowing liquid refrigerant to the intake side of the vaporization coil, the flow inducing means being sized to supply the vaporization coil with a quantity of liquid refrigerant that exceeds the given amount of liquid refrigerant evaporated by the burner to maintain the refrigerant vapor in its wet state and to thereby prevent a decomposition of the refrigerant due to overheating; and a second pipe fluidly connected to an outlet side of the vaporization coil and to a vapor intake side of the condenser for flowing heated, vaporized refrigerant from the vaporization coil to the condenser to thereby supply the condenser with additional heat energy that is released upon the condensation of the vapor from the vaporization coil.

4,112,706
APPARATUS FOR FREEZING A SLUG OF LIQUID IN A SECTION OF A LARGE DIAMETER FLUID TRANSMISSION LINE

Beryle D. Brister, P.O. Box 2329, Amarillo, Tex. 79105

Filed Sep. 13, 1976, Ser. No. 722,665
Int. Cl.[2] F25D *17/00*; G01M *03/02*
U.S. Cl. 62—514 R 22 Claims



1. Apparatus for freezing a slug of liquid in a section of a fluid transmission line comprising:

an envelope having side portions for enclosing a section of the transmission line and end portions for engaging the transmission line, the side and end portions defining an annular chamber when assembled around the transmission line, the chamber being operable when filled to confine a volume of cryogenic cooling fluid in its liquid phase in intimate contact with the entire exterior surface of the transmission line enclosed by the envelope whereby the freezing effect is achieved substantially by sensible heat flow from the surface of the transmission line through the surrounding mass of liquid cooling fluid in response to convection currents generated by said sensible heat transfer, said envelope including intake port means for admitting a flow of cryogenic cooling fluid into the chamber and exhaust port means for discharging cryogenic cooling fluid out of the chamber;

manifold means disposed within the chamber connected in fluid communication with the intake port means for distributing the flow of cryogenic cooling fluid within the chamber; and,

a plurality of conduit means connected in fluid communication with said manifold, each conduit means including an opening for discharging a stream of cryogenic cooling fluid into the chamber and onto at least a portion of the surface of the transmission line.

4,112,707
JEWELRY ARTICLE WITH RADIOMETER THEREIN

Robert Joseph, 25 Hahn Pl., Kitchener, Ontario, Canada (N2M 1R4)

Filed Sep. 8, 1976, Ser. No. 721,347
Int. Cl.[2] A44C *17/00*, *25/00*
U.S. Cl. 63—31 4 Claims

1. An article of jewelry comprising:

an evacuated substantially transparent chamber,

means within said chamber for mounting a plurality of vanes for rotation about an axis, each said vane having a light absorbing surface on one side and a light reflecting surface on the other, said mounting means including a pair of coaxial shafts fixed to said chamber having spaced but adjacent ends, and a hub rotatably mounted between the ends of said shafts upon which said vanes are mounted,

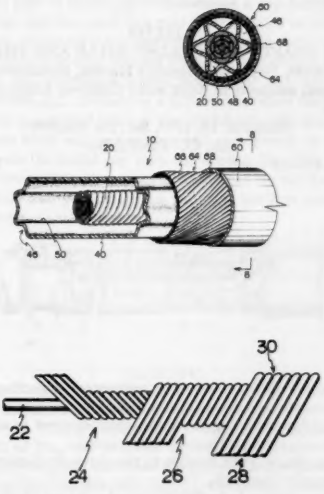
a ring attached to one of said shafts exteriorly of said chamber, and

means on said ring for attaching and securing said chamber to a person.

4,112,708
FLEXIBLE DRIVE CABLE

Mataharu Fukuda, Toyonaka, Japan, assignor to Nippon Cable Systems Inc., Takarazuka, Japan

Filed Jun. 21, 1976, Ser. No. 697,939
Int. Cl.[2] F16C *1/10*
U.S. Cl. 64—2 R 20 Claims



1. A flexible drive cable which comprises:

an elongated torque-transmitting core member;

an elongated tubular liner member made of plastic material defining an internal passage adapted to receive and rotatably support said core member;

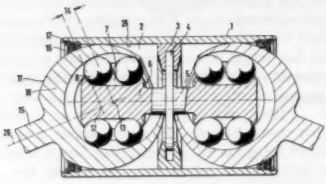
an elongated tubular outer member for holding therein said liner member; and

at least one caved portion being disposed between the exterior of said liner member and the interior of said outer member.

4,112,709
DOUBLE UNIVERSAL JOINT

Werner Krude, Neunkirchen, Fed. Rep. of Germany, assignor to Uni-Cardan AG, Lohmar, Rheinland, Fed. Rep. of Germany

Filed Sep. 24, 1976, Ser. No. 726,120
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1975, 2542736
Int. Cl.[2] F16D *3/30*
U.S. Cl. 64—21 6 Claims

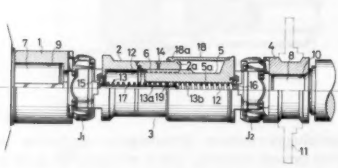


1. A double universal joint comprising a pair of individual universal joints each having first and second joint members, said second joint members each having a spherical outer surface, a centering plate positioned axially between said individual universal joints and movable perpendicular to the axis of rotation of the joint, said centering plate connected to the first members of each joint, a casing having guide surfaces thereon to guide the spherical outer surfaces of said second joint members, means within said casing for guiding said centering plate in movement perpendicular to the axis of rotation of the double universal joint, the centers of curvature of said spherical surfaces being offset equal distances from the centers of the respective individual universal joints when the joint is in its unbent position.

4,112,710
DRIVE SHAFT FOR ROLLING MILLS AND THE LIKE

Hiroji Okuda, Nara, and Shigenori Harada, Kashiharashi, both of Japan, assignors to Koyo Seiko Company Limited, Osaka, Japan

Filed Jul. 15, 1977, Ser. No. 816,088
Int. Cl.[2] F16D *3/06*
U.S. Cl. 64—23 5 Claims



1. A drive shaft for a rolling mill inter-connecting a drive shaft element and a driven shaft element for the transmission of torque and maintaining the drive shaft element in alignment with the driven shaft element comprising:

a drive fitting yoke fittable to the drive shaft element and rotatable therewith,

a driven fitting yoke fittable to the driven shaft element rotatably therewith and detachably mountable on the driven shaft element,

a sleeve-shaped drive shaft member connected to the drive fitting yoke by a joint member, the drive fitting yoke, the joint member and the drive shaft member providing a universal joint assembly, the drive shaft member being splined at its one end,

a sleeve-shaped driven shaft member connected to the driven fitting yoke by a joint member, the driven fitting yoke, the second-mentioned joint member and the driven shaft member providing a universal joint assembly, the driven shaft member being splined and engaged with the splined end of the drive shaft member so as to be slidable only axially and to transmit the torque, the drive and driven shaft members being combined to define a hollow chamber coaxially extending through the shaft members,

a spring disposed within the hollow chamber defined by the shaft members and biasing the shaft members axially away from each other, and

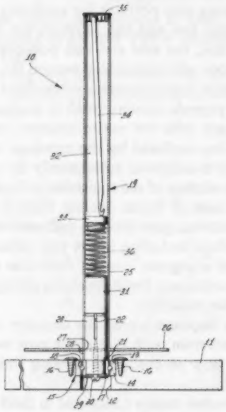
means limiting the maximum length of axial extension of the shaft members, the limiting means restraining the shaft members from extension so that the entire length of the drive shaft is not greater than the definite invariable distance between the base portion of the drive shaft element and the base portion of the driven shaft element,

whereby the limiting means prevent the biasing force of the spring from being delivered to the joint members, the fitting yokes, the drive shaft element and the driven shaft element when the drive shaft is mounted in place.

4,112,711
DIRECT-FROM-SKEIN YARN FEEDER

Luther W. Tripp, 937 Campus, Redlands, Calif. 92373

Filed Mar. 7, 1977, Ser. No. 774,979
Int. Cl.[2] D04B *33/00*
U.S. Cl. 66—1 A 4 Claims



1. A direct-from-the-skein yarn feeder comprising:

a base comprising a circular flat block of pressed wood or the like, having a central bore and a counterbore;

a bearing on said base, said bearing comprising a radial ball bearing with co-planar inner and outer races, said outer race fitting in said counterbore;

a skein mounting mast, said mast comprising a cylindrical tube, the lower end whereof having inserted upwardly therein a wooden plug which also fits downwardly into said inner race and thereby journals in said bearing;

a skein supporting platform fixed on said mast near the lower end thereof, said mast and platform freely rotating with a skein mounted thereon as yarn is withdrawn from said skein;

means for securing said inner race to said plug;

means for securing said outer race rigidly to said base; and

a short tubular collar of approximately the same inside diameter as said tubular mast fitting said plug so as to itself rest on the upper end of said inner bearing race,

said platform being formed of thin sheet material and having a central hole with the same inside diameter as said tubular mast,

said platform fitting said plug and being assembled thereon

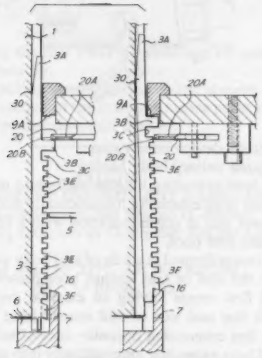
between said mast and said collar so as to be snugly gripped between said mast and said collar and said inner race when said plug is assembled as aforesaid on said inner race.

4,112,712

ROCKING JACK SAFETY DEVICE

Franco Bini, Florence, Italy, assignor to Macchine Tessili Circolari Matec S.p.A., Rome, Italy

Filed Jun. 30, 1977, Ser. No. 811,822
Claims priority, application Italy, Jul. 21, 1976, 9534 A/76
Int. Cl.[2] D04B *35/10*
U.S. Cl. 66—157 **3 Claims**



1. In a circular knitting machine, rocking selector jacks having butts including: selection butts, needles associated with the jacks, means co-operating with the selection butts to provide a selection of said selector jacks, a first, raising, cam for raising the selected jacks whereby the associated needles are raised in a zone to take a yarn, and a second cam located in correspondence of said raising zone being defined by a forward end portion including an entry profile, said entry profile being inclined to the radial direction of the cylinder, and being further defined by a lower profile extending parallel to the trajectory of the jacks which have not been raised by the raising cam, said lower profile of the second cam co-operating with a butt of the latter jacks to prevent unintentional raising thereof, said butt being longer than butts adjacent thereto; and resilient bias means biasing the second cam whereby the second cam can be displayed against said bias, by a said butt of a jack which has been raised, unintentionally, prior to reaching the second cam.

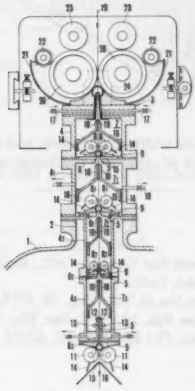
4,112,713

SELVAGE CURLING PREVENTION APPARATUS FOR A KNITTED CLOTH

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Japan

Filed Apr. 18, 1977, Ser. No. 788,466
Claims priority, application Japan, Apr. 26, 1976, 51-47521
Int. Cl.[2] D06B *23/18*
U.S. Cl. 68—5 E **7 Claims**

1. A selvage curling prevention apparatus for a knitted cloth comprising a high pressure steamer vessel having a cloth inlet, wall means mounted on and extending outwardly from said vessel and forming an elongated passageway through said cloth inlet into said vessel for the straight line passage of the cloth through the passageway into said steamer vessel, said passageway having a first end located exteriorly of said vessel and a second end located within said vessel, a roll sealing mechanism located at the first end of said passageway and including a pair of sealing rolls positioned at the first end of said passageway and forming a seal closure for the cloth being introduced into said passageway for subsequent passage into said vessel, said wall means including transverse walls dividing said elongated passageway transversely of its elongated direction into a plurality of serially arranged pressure reduction chambers with said transverse walls forming aligned openings disposed in a straight line therethrough for passage of the cloth between adjacent said pressure reduction chambers, said transverse walls having a first side closer to the first end of said passageway and a second side facing in the opposite direction and being closer to the second end of said passageway, pairs of first metal gap rolls each mounted on the first side of at least a plurality of adjacent said transverse walls commencing with said transverse wall closest to the first end of said passageway,



each said pair of metal gap rolls forming a gap therebetween selected so that the cloth can pass therethrough in a flat manner, a pair of second metal gap rolls located on the second side of said transverse wall located at the second end of said passageway and positioned within said vessel and said pair of second metal gap rolls having a gap therebetween corresponding to the gap of said pairs of first metal gap rolls and permitting steam from said vessel into said passageway so that the steam heats the metal gap rolls for heating the cloth and the steam within said passageway also supplies humid heat to the cloth while said pair of sealing rolls seal the first end of said passageway.

4,112,714

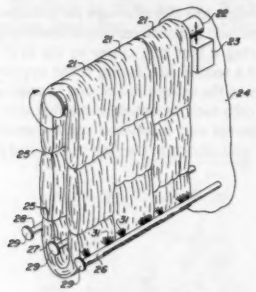
ASYMMETRIC SKEIN DYEING

Isadore Rosenthal, Levittown; Lawrence J. Exner, Ambler; Gregory J. Niksa, Collegeville; Warren I. Weiss, Southampton, all of Pa., and Maurice G. Young, Cinnaminson, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 641,405, Dec. 17, 1975, Pat. No. 4,052,155.
This application May 16, 1977, Ser. No. 797,096
Int. Cl.[2] D06B *1/02, 11/00*
U.S. Cl. 68—206 **10 Claims**

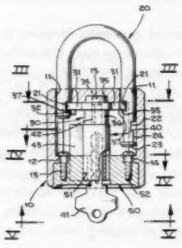
1. Apparatus for random skein dyeing of yarn, including rotatable support means for axially supporting and rotating at least one skein thereon, first and second dye delivery means below said support member and spaced apart on opposing sides of said skein and generally parallel to said sides, said first dye delivery means being adjacent an exterior side of said skein and said second dye delivery means extending through said skein, said dye delivery means having dye discharge outlets posi-

tioned to discharge dye to at least one discrete location on said skein but to less than the number of locations effective for



dyeing across the full width of said skein, and said dye delivery means being devoid of other dye discharge outlets.

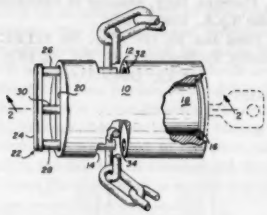
4,112,715
PADLOCK
Tim M. Uyeda, South San Gabriel, Calif., assignor to Klaus W. Gartner, La Palma, Calif.
Continuation of Ser. No. 617,514, Sep. 29, 1975, abandoned. This application Feb. 10, 1977, Ser. No. 767,301
Int. Cl.[2] E05B 67/02, 67/12
U.S. Cl. 70—38 A **1 Claim**



1. In a padlock having a body, shackle means having first and second portions, means for receiving said portions of said shackle means within said body and internal locking means for locking with said portions and operable by an associated key in a given direction to open the padlock, said shackle means having a first, fully locked position in which said first and second portions thereof are received in said receiving means, and a second fully unlocked position in which said second portion is outside said body, the improvement comprising the provision of:

means for removeably retaining said first portion of said shackle means to said body when said shackle means portions are unlocked by said internal locking means, said retaining means and said first shackle portion comprising cooperating means for fully releasing said first portion for complete removal of said shackle means from said body upon positioning said shackle means first portion in a position in said body intermediate said fully locked and fully unlocked positions and upon rotating said shackle means about the axis of said first portion to a predetermined position in which said second portion is non-aligned with said receiving means therefor and upon turning said associated key in said locking means in a reverse direction to said given direction.

4,112,716
PADLOCK DEVICE
Joachim Wippich, Campbell, Calif., assignor to Research Machine & Development, Inc., Santa Clara, Calif.
Filed May 18, 1976, Ser. No. 687,515
Int. Cl.[2] E05B 67/02, 67/22
U.S. Cl. 70—38 C **11 Claims**



1. A padlock device comprising:

an elongated unitary body having

a first bore extending longitudinally into one end thereof,

a second bore extending longitudinally into the other end thereof and in communication with a first side portion of said first bore,

a first recess formed in a side of said body and located such that the axis of said second bore passes therethrough, said first recess having an external perimeter formed such that said axis of said second bore lies internal of any line connecting opposite sides of said perimeter,

a third bore extending longitudinally into said other end of said body and in communication with a second side portion of said first bore, and

a second recess formed in another side of said body and located such that the axis of said third bore passes through a central portion thereof;

a lock cylinder adapted to fit within said first bore and having

a first laterally movable pawl capable of being extended at least part way into said second bore,

a second laterally movable pawl capable of being extended at least part way into said third bore, and

a first eccentric cam for engaging said first pawl and a second eccentric cam for engaging said second pawl, said cams being joined and rotatable together and being configured such that rotation thereof through a first angle causes said first pawl to be moved into said second bore and rotation through a second angle causes said second pawl to be moved into said third bore; and

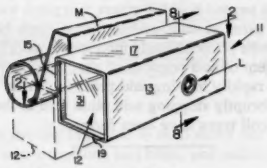
shackle means including first and second elongated shackle pins each having a notch provided in one side near distal ends thereof, said pins being respectively disposed within said second and third bores and movable between a first position in which said distal ends respectively extend completely through said first and second recesses so that said notches can be engaged by said first and second pawls, and a second position wherein said distal ends extend less than half way through said first and second recesses, the distal end portions of said pins being partially enclosed by and thus protectively shielded by the portions of said body surrounding said recesses.

4,112,717
KEY BOX
Terrag W. Bradley, Monroe, Oreg., assignor to Supra Products, Inc., Salem, Oreg.
Filed Apr. 15, 1977, Ser. No. 787,837
Int. Cl.[2] B65D 55/14; E05B 65/52
U.S. Cl. 70—63 **5 Claims**

1. In a key box,

a case,

a drawer slidable into the case,
first locking means within the case for locking the drawer against removal,
and second locking means exposed at the exterior of the case



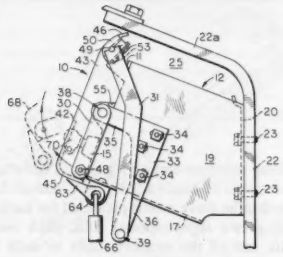
for actuating the first locking means and for pushing said drawer outwardly,
said second locking means having a lost motion action to facilitate actuation of the first lock means prior to exerting a pushing force against said drawer.

4,112,718

LINK-SUPPORTED INSTRUMENT PANEL GUARD

John S. Logsdon, Chillicothe, and George H. Meiner, III, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 10, 1977, Ser. No. 823,300
Int. Cl.[2] B60K *37/00*
U.S. Cl. 70—159 **10 Claims**



1. A vandalism guard for a vehicle control console having an upright front panel containing instruments to be protected comprising:
a protective cover for enclosing the instrument front panel of the console, said cover being movable between an out-of-the-way storage position above and overlaying the console and an enclosing position over the instrument front panel, the upper and lower ends of said cover being respectively positioned adjacent the top and bottom of the instrument front panel when said cover is moved to said enclosing position;
a first long link pivotally connecting the upper end of said cover to a pivot base support carried by the vehicle below and rearwardly of the instrument front panel, said first link guiding and controlling swinging movement of the cover upper end between said instrument enclosing and storage positions through a relatively flat arc extending from the upper front panel to the upper rear console;
a second short link pivotally connecting the lower end of said cover to a pivot base support carried by the vehicle adjacent the instrument front panel intermediate the top and bottom thereof, said second link guiding and controlling swinging movement of the cover lower end between said instrument enclosing and storage positions through a relatively sharp arc extending from the lower front panel to the upper front panel; and
lock means for securing said cover to the vehicle in enclosing position, said links holding the cover immovable relative to the vehicle when said lock means is engaged.

4,112,719

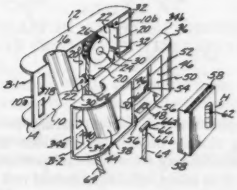
Patent Not Issued For This Number

4,112,720

BICYCLE LOCK ASSEMBLY

Leonard O. Green, 620 E. Pine, Santa Ana, Calif. 92701

Filed Dec. 1, 1976, Ser. No. 746,486
Int. Cl.[2] E05B *71/02*
U.S. Cl. 70—233 **2 Claims**



1. In combination with a lock of the type that includes a substantially square body of substantial width that has a first opening therein that leads to a bifurcated bolt that may be selectively moved to either a first or second position by manually operated means that form a part of said lock, a support assembly for holding said lock in a fixed position on a tubular frame of a bicycle adjacent one of the wheels thereof, each of which wheels includes a plurality of circumferentially spaced radially extending spokes and a rim, said lock support assembly including:
a. first and second mating housing portions that interlock to engage a section of said frame adjacent one of said wheels, said first housing portion defining a confined spaced, said

second housing defining a cavity that is transversely aligned with said confined space, said first and second housing portions cooperating to provide a housing when interlocked with one another, with said cavity of such size that said lock body fits snuggly therein to have said first opening axially aligned with a second opening in said second housing portion;

b. first means for holding said first and second portions in interlocking relationship on said frame, said first means being concealed when said lock is disposed in said cavity;

c. second means for maintaining said lock in a permanent position in said cavity with said first and second openings axially aligned;

d. a cable that has first and second ends;

e. a spring loaded reel rotatably supported in said confined space, said first end of said cable secured to said reel, with said cable wound on said reel, and a portion of said cable extending outwardly through a third opening in said housing; and

f. a rigid T-shaped member rigidly secured to said second end of said cable, said T-shaped member including a first leg normal to said second end of said cable and a second leg axially aligned with said cable, with said cable when partially withdrawn from said housing, subsequently looped between spokes of one of said wheels, with said T-shaped member extended upwardly through said first and second openings being thereafter engaged by said bifurcated bolt when said lock is manually manipulated to move said bolt from said first to said second position and the looped portion of said cable maintaining the one of said wheels through which it extends in a substantially non-rotatable position to prevent the unauthorized riding of said bicycle.

4,112,721

NC COIL SPRING MANUFACTURING APPARATUS

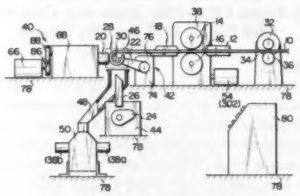
Hirobumi Takase, Yokohama, and Yutaka Utsunomiya, Ina, both of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Apr. 5, 1977, Ser. No. 784,917

Claims priority, application Japan, Apr. 7, 1976, 51-39089; Dec. 18, 1976, 51-152635

Int. Cl.[2] B21F *3/04, 11/00*

U.S. Cl. 72—12 **11 Claims**



1. A NC apparatus for manufacturing coil springs, said springs having closely coiled end portions and portions of changing pitch extending from said end portions and merging with the ends of an intermediate portion of coil turns having a predetermined pitch, said apparatus comprising: a coil spring forming mechanism having a pitch tool, a diameter tool, and a cutter; feed rollers for feeding an element wire into said coil spring forming mechanism; a mechanism for driving said feed rollers; a microcomputer having a memory storage and a central processing unit; an input unit for inputting data for coil spring forming into said computer; a rotary encoder for transmitting a pulse signal at a frequency corresponding to the travelling speed of said element wire; first, second and third counters for receiving setting signals transmitted from said computer and pulse signals transmitted from said rotary encoder and transmitting control signals for driving said pitch tool, coiling point, and cutter respectively; a first pulse motor and a second pulse motor to rotate upon receipt of control signals from said first and second counters respectively, thereby to drive said pitch tool and diameter tool, respectively, so as to form a coil spring, and a pitch tool feed mechanism driven by said first pulse motor for rapidly advancing said pitch tool at an initial speed from a first position where said pitch tool serves to form the closely coiled end portions of a coil spring to a second position where said pitch tool serves to form the coil turns at said predetermined pitch between the closely coiled end portions, said initial speed being sufficient to reduce the extent of said portions of changing pitch to a minimum, and for rapidly moving said pitch tool from the second position and abruptly stopping said pitch tool at the first position after the coil turns have been formed.

4,112,722

COLD PROFILING MACHINE

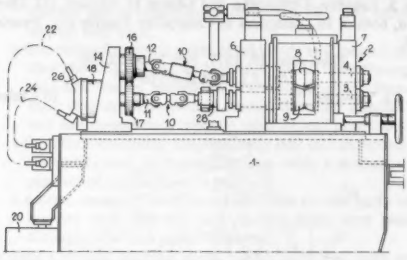
Michel Jean Boucard, Fontenay-le-Fleury, France, assignor to Societe Industrielle et Financiere le Profil, Saint-Cloud, France

Filed Jul. 28, 1977, Ser. No. 820,012

Claims priority, application France, Feb. 14, 1977, 77 04066

Int. Cl.[2] B21D *5/08*

U.S. Cl. 72—181 **5 Claims**



1. A profiling machine employing a cold deformation comprising a succession of heads aligned one behind the other, an individual hydraulic drive motor provided for each head, each head including two superimposed rolls, each roll having a support shaft, one of the support shafts in each head being connected to the corresponding hydraulic drive motor, connecting means for connecting said one support shaft of each of adjacent heads to the corresponding one support shaft of the adjacent head, said connecting means being capable of being disconnected, and a source of fluid under pressure being connected to all said hydraulic motors.

4,112,723

HYDROSTATIC EXTRUSION APPARATUS

Akira Asari, Osaka, and Hidehiro Tsuzuki, Toyonaka, both of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Division of Ser. No. 629,891, Nov. 7, 1975, Pat. No. 4,083,214. This application May 19, 1977, Ser. No. 798,572

Claims priority, application Japan, Nov. 7, 1974, 49/28758; Nov. 7, 1974, 49/28759

Int. Cl.[2] B21D *22/10*

U.S. Cl. 72—60 **3 Claims**

1. A hydrostatic extrusion apparatus for extruding a billet which comprises:

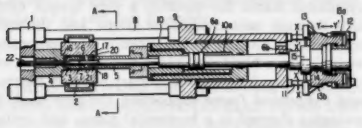
a container movably disposed along the central axis of said extrusion apparatus;

a platen disposed in front of said container;

a supply unit charged with an extrusion die, a pressure medium, said billet and a seal block member for sealing said pressure medium within said supply unit;

a stem mounted on said platen for increasing the pressure of said pressure medium within said supply unit;

means for retaining said supply unit at a charging position such that the forward end of said supply unit is held in close contact with and in coaxial alignment with said container;



means for driving said stem so as to move said extrusion die, said pressure medium, said billet, and said seal block member into said container; and,

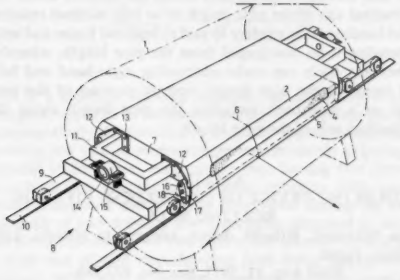
means for extruding said billet through said extrusion die.

4,112,724

TRANSPORTATION UNITS FOR SUPPORTING AND MOVING PLATE-FORMED ATTACHMENT MEMBER INTO AND OUT OF A PRESS STAND OF HYDRAULIC PRESS

Harry Claesson, and Keijo Hellgren, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Vasteras, Sweden

Filed Jun. 8, 1977, Ser. No. 804,838
Claims priority, application Sweden, Jun. 9, 1976, 7606461
Int. Cl.[2] B21D *22/10*
U.S. Cl. 72—63 **7 Claims**



1. A hydraulic press for pressing sheets of metal against a tool in order to be formed thereby, the press comprising:

an elongated press stand which is fixedly mounted, the press stand including a pressure space therein which is capable of containing a tool,

an elongated plate-formed attachment member which supports a flexible bag-like diaphragm and a press pad which is capable of contacting a sheet of metal and forming it around a tool in the pressure cell,

two transportation units connected to said plate-formed attachment member for moving said plate-formed attachment member with supported diaphragm and press pad into and out of said pressure space within said press stand,

track means for supporting said two transportation units and for conveying said two transportation units into and out of said pressure space within said press stand,

said two transportation units each including a transportation car and a connection, each said connection unit being connected to said plate-formed attachment member and each transportation unit including a bearing such that the plate-formed attachment member is rotatable about an axis formed between said transportation units, and at least one of said two transportation units includes means for raising and lowering the connection unit thereof and thus said plate-formed attachment member at the connection point with said connection unit.

4,112,725

METHOD AND APPARATUS FOR CONTINUOUSLY HOT-STRETCHING A STEEL CABLE

Yasuo Yamaguchi, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Sep. 13, 1977, Ser. No. 832,863
Claims priority, application Japan, Sep. 14, 1976, 51-110587
Int. Cl.[2] B21F *21/00*
U.S. Cl. 72—128 **7 Claims**

1. A method of hot-stretching a cable in which first, second and third capstans of different diameters, having a common rotating shaft, and having grooves on the circumferential surfaces thereof for winding said cable a plurality of turns are provided in parallel between a stranding machine and a winding machine and positioned adjacent to the stranding machine, first and second guide pulleys are provided in parallel and positioned adjacent to the winding machine, a front heat treatment equipment for heating said cable is provided between said first capstan and said second capstan, and a rear heat treatment equipment for heating said cable is provided between said second capstan and said third capstan, said method comprising the steps of

winding said cable around said winding machine through said first capstan, said first guide pulley, said second capstan, said second guide pulley and said third capstan,

increasing the operating speed of said stranding machine to a predetermined low speed after starting, and after the predetermined low speed is maintained for a predetermined period of time, gradually increasing the operating speed to a rated operating speed of said stranding machine, and

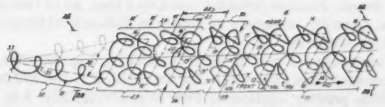
selectively operating said front heat treatment equipment and said rear heat treatment equipment, while at the same time selectively subjecting a first part of said cable lying between said first capstan and said second capstan and a second part of said cable lying between said second capstan and said third capstan to a predetermined tension, until the operating speed of said stranding machine reaches said rated operating speed after starting so that the entire length of said stranded cable is continuously and effectively subjected to a hot-stretching treatment.

4,112,726

METHOD AND APPARATUS FOR FORMING A ROW OF SPRING COILS FROM A CONTINUOUS LENGTH OF WIRE

Elvin E. Adams; Tom J. Wells, both of Carthage, Mo.; Horst F. Wentzek, Kenosha, Wis.; Henry Zapletal, Carthage, Mo., and Marty J. Zugel, Cleveland, Ohio, assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Sep. 12, 1977, Ser. No. 832,399
Int. Cl.[2] B21F *27/16*
U.S. Cl. 72—137 **49 Claims**



1. A method for forming a row of spring coils from a continuous length of spring wire, said method comprising the steps of forming a helix of continuous length from said continuous length of spring wire,

thereafter folding said continuous length helix into a wave-like configuration for providing a plurality of spring coils in a coil row, each of said coils being connected at one end with an adjacent coil to one side thereof by one connector section and being connected at the other end with an adjacent coil to the other side thereof by another connector section, each of said connector sections being disposed in a three-dimensional looped attitude in said folding step, and

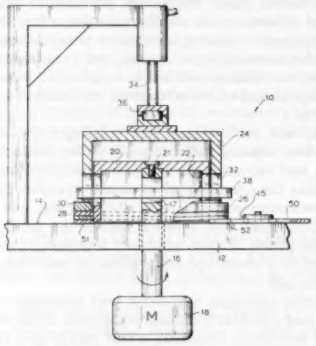
thereafter forming each of said connector sections into a desired configuration from that three-dimensional looped attitude established in said folding step, said forming step being performed after said folding step has been performed.

4,112,727

METHOD AND APPARATUS FOR MAKING PIPE FLANGES

Marshall B. Brown, P.O. Box 9515, Winter Haven, Fla. 33880

Filed Apr. 1, 1977, Ser. No. 783,668
Int. Cl.[2] B21D *7/04, 11/06*
U.S. Cl. 72—142 **15 Claims**



1. Apparatus for making flanges from bar stock of the type having a generally rectangular cross-section, comprising:

a substantially flat work surface for suporting said bar stock with the long sides of said stock parallel with the plane of said work surface;

a rotatable die positioned adjacent to said work surface;

means for rotating said die;

means for pinning one end of said bar stock in a position substantially parallel with said work surface;

a hollow bonnet surrounding said die and having a peripheral edge engaging said bar stock;

means for applying a force against said bonnet in directions generally parallel with the axis of said die;

means for rotating said pinning means with said die for bending said bar stock about one short side thereof and wrapping said bar stock about said die; and

means for rotating said bonnet with said die.

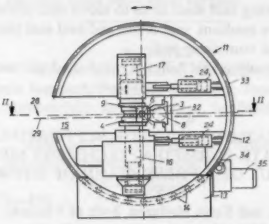
4,112,728

DEVICE FOR BENDING PIPES

Rolf Noack; Joachim Schuster, and Udo Lohse, all of Oberhausen, Germany, assignors to Deutsche Babcock Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 715,871, Aug. 19, 1976, abandoned. This application Jan. 26, 1978, Ser. No. 872,366
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1975, 2537382
Int. Cl.[2] B21D *7/04*
U.S. Cl. 72—154 **10 Claims**

1. In a device for bending pipes into a serpentine pipe bank having alternating right-hand and left-hand bends and in which the pipe is held, during the bending opertion, on a bending rail and the pipe end to be bent is clamped in a bending form, the improvement comprising, in combination, a cylindrical frame; means mounting a single set of bending tools, consisting of a non-rotatable rail and a driven rotatable bending form, within said cyindrical frame for bending a pipe length extending coaxially through said cylindrical frame and through said bending tools; the already formed portion of a serpentine pipe bank swinging in a horizontal plane during formation of each additional pipe bend therein; stationary support means adjacent said cylindrical frame supporting the pipe bank during such swinging thereof in a horizontal plane; said cylindrical



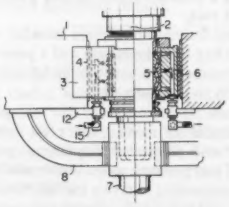
frame being formed with a radial slot accommodating the already formed portion of the pipe bank during such swinging thereof; such already formed portion being displaced horizontally out of said radial slot prior to formation of the next pipe bend; and means mounting said frame for rotation about the longitudinal axis of the pipe length to be bent without rotation of said bending form relative to said cylindrical frame and with the bending tools disengaged from the pipe length, whereby the bending tools can make alternating right-hand and left-hand bends in the pipe length without turning of the pipe length or a pipe bank including the pipe length about the longitudinal axis of the pipe length.

4,112,729

COUPLING DEVICE OF OIL FEEDING PIPE FOR ROLLING MILL

Takao Sakanaka, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 11, 1977, Ser. No. 823,748
Claims priority, application Japan, Aug. 25, 1976, 51/100543
Int. Cl.[2] B21B *27/06, 31/08*
U.S. Cl. 72—236 **12 Claims**



1. A coupling device of oil feeding pipe for rolling mill housing a roll assembly composed of a roll rotatably supported by a pair of roll chocks on driving and driven side of said rolling mill and a mill housing in which said roll assembly being built and exchangeable in axial direction of said roll comprising;

a tubular coupling having a pair of tubular members provided at least one of driving and driven side being in liquid sealing engagement to supply and exhaust lubricating oil to and from said roll chocks,

one of said tubular member provided on said roll chock and the other provided on a guide member slidably mounted on said mill housing in such a manner that said tubular members are capable to move in response to vertical movement of said roll assembly, and

said tubular member coaxially positioned to couple upon exchange of said roll assembly.

4,112,730

CARRIAGE DRAWING MACHINE FOR UNIFORMLY DRAWING ELONGATED MATERIAL TO BE DRAWN

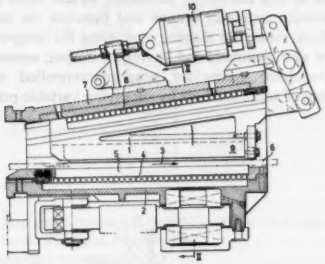
Johann Greven, Aachen, Germany, and Johann Mostert, Eupen, Belgium, assignors to Schumag Schumacher Metallwerke Gesellschaft mit beschrankter Haftung, Aachen, Germany

Filed Aug. 29, 1977, Ser. No. 828,884

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2716657

Int. Cl.² B21C *1/28*

U.S. Cl. 72—290 **14 Claims**



1. In a carriage drawing machine for uniformly drawing elongated material to be drawn, having two drawing carriages reciprocatingly displaceable in mutually opposite directions, a drawing jaw vise on each carriage for alternately gripping the material to be drawn, each of the vises having two drawing jaws held in a housing by a wedge structure with bearing rollers interposed which serves to self-lock during the drawing, both of said drawing jaw vises being disposed to receive and simultaneously draw two bars of the material to be drawn, at least one of said two drawing jaws being engageable in common with both of the bars, and including an equalizing support in association with the other of said two drawing jaws.

4,112,731

LIGHT GAUGE SHEET METAL FORMING MACHINE

Leroy E. Anderson; David V. Charlson, and Mark A. Vierkant, all of Detroit Lakes, Minn., assignors to Manufacturers Systems, Inc., Detroit Lakes, Minn.

Filed Jan. 24, 1977, Ser. No. 761,801

Int. Cl.² B21D *5/04*

U.S. Cl. 72—320 **24 Claims**

1. A sheet metal forming machine comprising:

(a) a rigid frame;

(b) a bed fixedly carried by said frame and having a breaking edge at the forward end thereof;

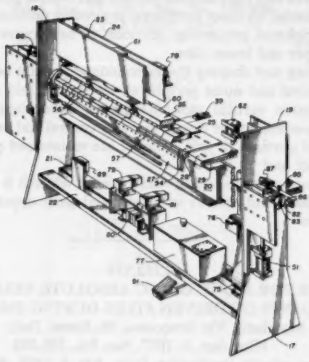
(c) a clamping bar movably mounted upon said frame for movement between clamping and non-clamping position relative to said bed for clamping a sheet of metal therebetween along said breaking edges and having an underside surface;

(d) an elongated mounting channel extending longitudinally of said clamping bar and formed in its said underside surface and having vertically extending side walls;

(e) said clamping bar including a plurality of clamping fingers of various widths each having an upstanding mounting bar extending upwardly thereabove constructed and arranged to be laterally slidable and removably received within said channel to support its associated clamping finger upon said bar for universal sliding adjustment longitudinally of said channel along said breaking edge;

(f) the forward ends of said clamping fingers terminating co-planar with said breaking edge of said bed when so mounted within said channel;

(g) horizontally adjustable mechanical securing means carried by said clamping bar opposite said channel and extending thereinto transversely of its side walls for securing said mounting bars of said clamping fingers in desired position within said channel; and



(h) a forming bar pivotally mounted on said frame for close pivotal arcuate movement around said clamping bar fingers and the breaking edge of said bed for cooperative forming of such a sheet of metal therebetween.

4,112,732

METHOD AND APPAPATUS FOR SHAPING INTEGRALLY-SHAPED TYPE BRAKE DISKS FOR CARS

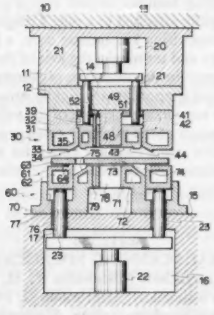
Hiromu Okunishi, Sayama; Hideki Nakaji, Kawagoe; Hiroyuki Suwa, Sayama, and Hideaki Sato, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1977, Ser. No. 789,013

Claims priority, application Japan, Apr. 28, 1976, 51-48962

Int. Cl.² B21J *13/02*

U.S. Cl. 72—334 **13 Claims**



1. A method of forming an integrally-shaped brake disk for a vehicle, comprising the steps of:

heating a brake disk material to a quenching temperature or a heating temperature range set from the hardness required for said brake disk;

maintaining said material heated while inserting said heated

material between upper and lower dies of a brake disk forming apparatus;

strongly pressing and holding the outer peripheral portion and central portion of said material with outer and inner movable upper and lower dies;

biting both front and back surfaces of a first boundary part between an intermediate portion and said outer peripheral portion of said material and a second boundary part between said intermediate portion and central portion of said material, by inner peripheral projecting portions and outer peripheral projecting portions of said outer and inner upper and lower dies;

drawing and shaping the intermediate portion between said central and outer peripheral portions of said material by relative vertical motion between either inner or outer upper and lower dies, while said central and outer peripheral portions of said material are maintained pressed and held; and

continuously quenching said material while it is maintained pressed and held by said outer and inner upper and lower dies.

4,112,733

DEVICE FOR MONITORING ABSOLUTE VELOCITY OF POINTS OF DRIVEN PILES DURING IMPACT

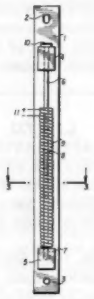
Silvano Marchetti, Via Bracciano, 38, Rome, Italy

Filed Apr. 6, 1977, Ser. No. 785,292

Claims priority, application Italy, Apr. 6, 1976, 48881 A/76

Int. Cl.[2] G01N *3/34*

U.S. Cl. 73—12 **3 Claims**



1. A device for the measurement of the absolute velocity of a driven pile during hammer impact comprising: a base plate adapted to be rigidly attached to a pile; a magnetic core velocity transducer comprising a magnetic core, a hollow coil surrounding the core and terminals, the axis of the velocity transducer being aligned in the direction of movement of the pile during impact; and support means rigidly attached to the base plate and rigidly supporting the core of the velocity transducer so that during impact of the pile only relative movement of the coil over the core occurs which generates a voltage at the transducer terminals proportional to the relative velocity of the transducer with respect to the pile.

4,112,734

DIFFERENTIAL SCANNING MICROCALORIMETER

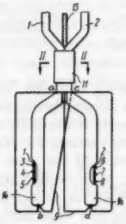
Vladimir Ilich Goryachev, Mikroraion V, 31, kv. 32; Grigory Vladimirovich Kotelnikov, Mikroraion G, 10, kv. 56, both of Puschino Serpukhovskogo raiona, Moskovskoi oblasti, and Pavel Semenovich Makurin, Sirenevy bulvar, 62, kv. 213, Moscow, all of U.S.S.R.

Filed Nov. 10, 1975, Ser. No. 630,362

Int. Cl.[2] G01K *17/00*

U.S. Cl. 73—15 B **5 Claims**

1. A differential scanning microcalorimeter comprising: a sample calorimetric chamber made as an elongated tube bent so that both ends of the tube are in close contact with each other over a section disposed between the outlet ends of the tube and a working volume of the sample chamber; a reference calorimetric chamber made as an elongated tube bent so that both ends of the tube are in close contact with each other over a section disposed between the outlet ends of the tubes and a working volume of the reference chamber, said sections of each of said tubes being in close contact with each other; first temperature regulator means for equalizing the temperatures between the chambers by applying additional electric power to heat said sample chamber responsive to a signal indicating a temperature difference between said chambers and for issuing a signal proportional to said additional power to be recorded in recording means, said first temperature regulator means having an input and an output; heater elements, for heating said sample and reference chambers, connected to said output of said first temperature regulator means and disposed on said chambers; temperature-sensing elements, for determining the temperature of each of said chambers, connected to said input of said first temperature regulator means and installed on each of said chambers; means for shaping a program for temperature scanning of said chambers and having an output; second temperature regulator means for program-controlled temperature scanning of said chambers by supplying variable power to said

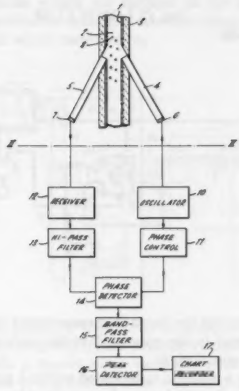


heater elements of said chambers in response to a signal from said means for shaping a program for temperature scanning, said second temperature regulator means having inputs and outputs, said inputs being coupled with said temperature-sensing elements and with said output of said means for shaping a program for temperature scanning, and said outputs being coupled with said heater elements of said chambers; third temperature regulator means serving to separate the working volumes, said third temperature regulator means having an input and an output; additional temperature-sensing elements for separating the working volumes, installed on said working volumes of said chambers and coupled to said input of said third temperature regulator means to supply said third temperature regulator means with a signal indicating a temperature difference over the length of the working volumes of each of said chambers; an additional heater element coupled to said output of said third temperature regulator means and disposed on said section of contact between said chambers beyond said working volumes, said additional heater element serving to reduce to zero the temperature difference over the length of the working volumes by heating them from said third temperature regulator means in response to a signal indicating the temperature difference over the length of the working volumes and supplied from said additional temperature-sensing elements.

4,112,735
DETECTION OF BUBBLES IN A LIQUID

James Alan McKnight, Altrincham, England, assignor to United Kingdom Atomic Energy Authority, England

Filed Aug. 30, 1977, Ser. No. 829,134
Claims priority, application United Kingdom, Sep. 13, 1976, 37927/76
Int. Cl.[2] G01N 29/02
U.S. Cl. 73—19 11 Claims



1. Apparatus for detecting a bubble in a liquid stream contained in a metal duct and comprising,

(a) a transmitter waveguide;

(b) an ultrasonic sending transducer disposed at one end of the transmitter waveguide for sending an ultrasonic signal of 1MHz through the waveguide;

(c) a receiver waveguide;

(d) a receiving transducer at one end of the receiver waveguide, the waveguides being disposed one on one side and one on the other side of the duct and of the same material and integral with the duct as the other end of the waveguides, each waveguide being at the same angle of between 15° to 30° to the longitudinal axis of the duct;

(e) a sending oscillator connected to the sending transducer;

(f) a receiving means for receiving a signal from the receiving transducer;

(g) a first high-pass filter for removing background noise to which the receiving means provides an output in response to the signal from the receiving transducer;

(h) a frequency translator which is arranged to receive an output signal from the first high-pass filter, and from the sending oscillator, and is arranged to reduce the frequency of the signal it receives from the high-pass filter to 4 KHz;

(i) an amplitude limiter to which the frequency translator provides an output and which ensures that all signals therefrom have the same amplitude without changing the phase thereof;

(j) a reference oscillator to which the frequency translator also provides an output and which averages the frequency of the output it receives and introduces a delay thereby;

(k) a phase control means to which the reference oscillator provides an output;

(l) a phase detector means for detecting and accepting transient asymmetric sidebands in the waveband of signals it receives from the amplitude limiter and the phase control means and rejecting both symmetric and non-transient asymmetric signals thereof;

(m) a second high-pass filter for receiving an output from the phase detector means to limit the frequency range of the output signal from the second high-pass filter;

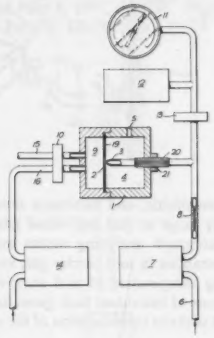
(n) a peak detector means for receiving an output signal from the second high-pass filter, and

(o) a pulse height analyser for receiving an output from the peak detector means.

4,112,736
GAS DETECTOR

Alfred G. Wheldon, and Ernest D. Harris, both of Dagenham Dock, England, assignors to The Distillers Company (Carbon Dioxide) Ltd., Reigate, England

Filed Jan. 17, 1977, Ser. No. 759,900
Int. Cl.[2] G01N 7/10
U.S. Cl. 73—23 27 Claims



1. A detector for detecting the presence of a particular gas in a mixture of gases, a membrane having two faces permeable by said particular gas at a rate greater than the other gases in said mixture, a thin flexible diaphragm and wall means, said membrane, said diaphragm and said wall means defining an enclosed space, said detector also including a nozzle to which, in use, a gas is supplied at a steady pressure, said nozzle having an opening at one end in proximity to said diaphragm so that movement of said thin flexible diaphragm interferes directly with the flow of said gas through said nozzle, and means for supplying said mixture of gases to one face of said membrane, the arrangement being such that when said particular gas is present in said mixture of gases said particular gas permeates through said membrane from said one face to change the pressure in said enclosed space causing said diaphragm to move to interfere with the flow through said nozzle and thereby produce a change of pressure in said supply of gas upstream from said nozzle, whereby said change in pressure constitutes a pneumatic signal indicating the presence of said particular gas in said mixture of gases.

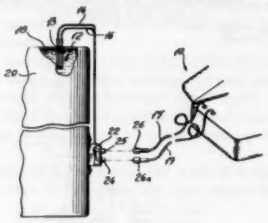
4,112,737
TRANSFORMER FAULT DETECTION

James E. Morgan, Kirkland, Canada, assignor to Morgan Schaffer Corporation, Montreal, Canada

Filed Apr. 27, 1977, Ser. No. 791,512
Int. Cl.[2] G01N 7/10
U.S. Cl. 73—23 8 Claims

1. In electrical equipment containing insulating oil wherein fault gases may be generated, the improvement comprising means for detecting and measuring said fault gases, said means comprising a cell adapted to be located in a potential fault gas environment within said electrical equipment, said cell including an inlet manifold and an outlet manifold, a plurality of elongated hollow tubes, each of said tubes communicating respectively with said inlet and outlet manifolds, each of said tubes being permeable to gases but impermeable to liquids, hollow extension leads extending from said inlet and outlet manifolds, a portable analytical measuring device, means for removably connecting said hollow extension leads to respective inlet and outlet conduits in said measuring device, said

measuring device including a gas chromatograph analyzing means, means in said portable measuring device for passing a carrier gas through said inlet conduit, through said hollow tubes, and through said extension leads and said outlet conduit for flushing into said gas chromatograph analyzing means a sample gas which is allowed to come to equilibrium in said cell, the minimum volume of sample gas in said cell at equilibrium being defined by the internal volume of said plurality of hollow



tubes and said manifolds, said minimum sample gas volume being sufficiently large so that individual gases separated by said gas chromatograph analyzing means temporarily attain constant concentrations in said carrier gas, said constant concentrations being independent of said sample gas volume so that concentrations of individual fault gases in said sample gas can be measured without consideration of the actual volume of said sample gas.

4,112,738

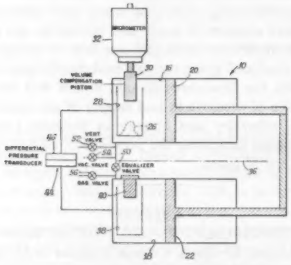
METHOD AND APPARATUS FOR DETERMINING THE VOLUME OF A CONDENSED MATERIAL SAMPLE

Philip L. Turner, Del Mar, Calif., assignor to Systems, Science and Software, La Jolla, Calif.

Filed Apr. 18, 1977, Ser. No. 788,559

Int. Cl.² G01F *17/00*

U.S. Cl. 73—32 R **12 Claims**



1. A method for determining the volume of a condensed material sample comprising the steps of; confining a predetermined gas in each of a pair of substantially equal volume chambers one of which is adapted to receive a condensed material sample therein of unknown volume, establishing equal free space volumes within said chambers by adjusting the volume of one of said chambers so that the number of moles of said gas within each chamber is equal, inserting said sample of unknown volume within said sample receiving chamber, and again establishing equal free space volumes within said chambers by changing the free space volume of said sample receiving chamber so that the number of moles of gas within each chamber are equal, said change in free space volume of said sample receiving chamber after inserting said sample therein being the exact volume of said sample.

4,112,739

PROCESS AND APPARATUS FOR THE ISOSTATIC MEASUREMENT OF THE PERMEABILITY OF A MATERIAL TO THE PASSAGE THERETHROUGH OF A GAS OR VAPOR

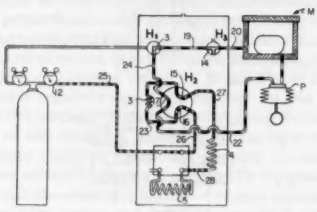
Georges H. Lyssy, Rotfluhstrasse 87, CH 8702 Zollikon 2H, Switzerland

Filed Oct. 13, 1977, Ser. No. 841,956

Claims priority, application Switzerland, May 20, 1977, 006222/75

Int. Cl.² G01N *15/08*

U.S. Cl. 73—38 **17 Claims**



1. A process for the isostatic measurement of the permeability of a material to the passage therethrough of gas or vapor, said process comprising:

positioning a material to be tested within a gas-tight chamber such that first and second opposite sides of said material are isolated from each other within said chamber;

circulating a reference gas through an enclosed reference circuit which includes a first portion of the interior of said chamber which is on said first side of said material;

maintaining the pressure of said reference gas within said reference circuit at the same pressure as the gas or vapor existing in a second portion of said chamber which is on said second side of said material;

whereby said gas or vapor will permeate through said material, from said second side to said first side thereof, into said reference gas within said reference circuit, as a function of the permeability of said material, thereby forming contaminated reference gas;

continuously passing, as a carrier gas, the same type of gas as said reference gas through a carrier circuit which includes a gas chromatography detection apparatus;

maintaining said carrier gas at a pressure higher than said pressure of said reference gas;

periodically injecting a portion of said contaminated reference gas within said reference circuit into said carrier circuit, whereby said carrier gas carries said portion of said contaminated reference gas to said detection apparatus; and

measuring the amounts of the components of said gas or vapor in said contaminated reference gas, by operation of said detection apparatus, as an indication of the permeability of said material.

4,112,740

METHOD AND APPARATUS FOR DETERMINING A CHANGE OF THE FLOW STATE OF FLOWABLE SUBSTANCES FROM ITS STATIC STATE TO ITS FLOWING STATE OR VICE VERSE

Marco Brandestini, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed Jul. 18, 1977, Ser. No. 816,715

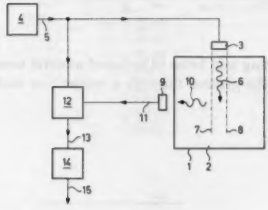
Claims priority, application Switzerland, Jan. 13, 1977, 392/77

Int. Cl.² G01N *29/02*

U.S. Cl. 73—53 **18 Claims**

1. A method of determining a change of the flow state of a flowable substance, comprising the steps of:

transmitting ultrasonic waves of substantially constant frequency to a spatial region of the substance;
receiving ultrasonic waves backscattered by the substance;
transforming the backscattered ultrasonic waves into a primary signal which is amplitude and phase modulated in accordance with the backscattering;
demodulating the primary signal to obtain a modulation signal which can be subdivided into a spectrum of signal components of different frequencies and possessing pseudo periods which are defined as the time spacing between successive mutually corresponding momentary values of the signal modulation;



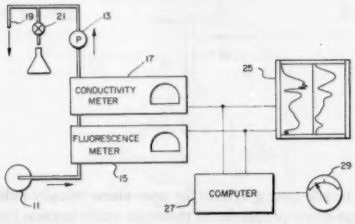
determining at least one time point at a mean value of the psuedo periods having a monotonous variation with time which entails a monotonous variation with time of the time duration of a predetermined number of pseudo periods;
comparing a time duration corresponding to a predetermined number of pseudo periods with a predetermined time duration; and wherein
the time duration of the predetermined number of pseudo periods traverses the predetermined time duration in the course of its monotonous variation with time.

4,112,741

SCANNING APPARATUS FOR SEPTIC EFFLUENTS

William B. Kerfoot, Falmouth, and Edward C. Brainard, II, Marion, both of Mass., assignors to Environmental Devices Corporation, Marion, Mass.

Filed Aug. 29, 1977, Ser. No. 828,471
Int. Cl.[2] G01N *21/34, 27/08*
U.S. Cl. 73—53 **10 Claims**



1. Apparatus for scanning shorelines to detect septic effluents emanating from on-shore septic systems; said apparatus comprising:
continuously operable sample intake means for drawing water from a preselected subsurface level adjacent the shoreline, said means being traversable along the shoreline;
a fluorometer for continuously measuring the fluorescence of the sampled water to determine the presence of aromatic hydrocarbons and soap whiteners which are present in distinctive proportions in recharged septic effluents and for generating a signal which varies as a function thereof;
conductivity measuring means for continuously measuring the conductivity of the sample water and for generating a signal which varies as a function thereof; and
signal processing means for generating an output signal which varies as a function of the conjoint deviation of said measurement signals from the values thereof which are representative of background water levels.

4,112,742

INSTRUMENT FOR MEASURING THE CONSISTENCY OF HIGH-CONSISTENCY MATERIALS

Edward A. Zahn, No. 2 San Remo Cir., Naples, Fla. 33940

Filed May 6, 1977, Ser. No. 794,666
Int. Cl.[2] G01N *11/00, 33/26*
U.S. Cl. 73—54 **4 Claims**

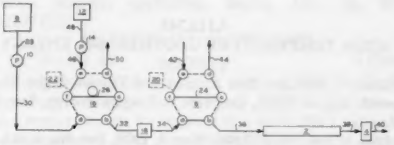
1. An instrument for measuring the consistency of high-consistency materials comprising a cylindrical tube which is flared at one end and an inverted springy U-shaped bale the legs of which terminate in turned end portions and engage diametrically spaced holes through the tube wall at a distance from the flared end less than one half the length of the tube, said bale serving to assist complete immersion into and withdrawal from a volume of the material to be measured, the amount of the material retained on the entire surface of said tube at the end of the drip cycle following its withdrawal being a measure of its consistency.

4,112,743

STEP-WISE GRADIENT CARRIER FOR LIQUID CHROMATOGRAPHY

Richard A. Mowery, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 15, 1976, Ser. No. 723,395
Int. Cl.[2] G01N *31/08*
U.S. Cl. 73—61.1 C **13 Claims**



1. A liquid chromatographic apparatus comprising:
a. a chromatographic column having an inlet and an outlet;
b. detector means in operable communication with the outlet of said column;
c. a first carrier liquid reservoir containing a first carrier liquid;
d. a second carrier liquid reservoir containing a second carrier liquid having a composition different from the composition of said first carrier liquid;

e. means for introducing said first carrier liquid under high pressure to the inlet of said column;

f. means for introducing a liquid sample to the inlet of said column; and

g. carrier valve means connected between said column inlet and said means for introducing said first carrier, said carrier valve means having a chamber of fixed volume, for said second carrier, including actuating means, for normally flowing said first carrier liquid through said valve means and for normally flowing said second carrier liquid from said second reservoir through said chamber for said second carrier and upon actuation of said carrier valve means for flowing said first carrier liquid through said carrier chamber thereby propelling at least a portion of said second carrier liquid into said column.

4,112,744

APPARATUS FOR DETECTING WATER IN OIL

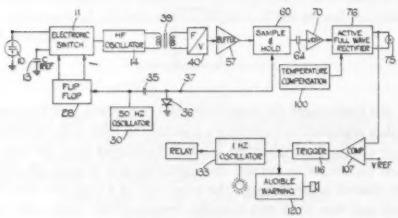
Peter Francis Tassano, Reading, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 14, 1977, Ser. No. 777,537

Claims priority, application United Kingdom, Mar. 13, 1976, 10158/76

Int. Cl.² G01N 27/22

U.S. Cl. 73—61.1 R **13 Claims**



1. Apparatus for the detection of water in oil comprising a capacitive probe unit through which the oil under test is caused to flow, a reference capacitor, switch means alternately connecting the capacitive probe and the reference capacitor into the circuit of an oscillator whereby the oscillator frequency is determined in alternate periods by the dielectric constant of the oil, a frequency to d.c. voltage converter connected to the output of the oscillator, filter means connected to the output of the converter for producing a signal fluctuating at the frequency of operation of said switch means and indicator means a.c. coupled to the output of the filter means sensitive to the amplitude of said fluctuating signal.

4,112,745

HIGH TEMPERATURE GEOTHERMAL ENERGY SYSTEM

Barkman C. McCabe, Los Angeles, and Edward Zajac, Hollywood, both of Calif., assignors to Magma Energy, Inc., Los Angeles, Calif.

Division of Ser. No. 683,506, May 5, 1976, Pat. No. 4,043,129. This application Jun. 7, 1977, Ser. No. 804,458

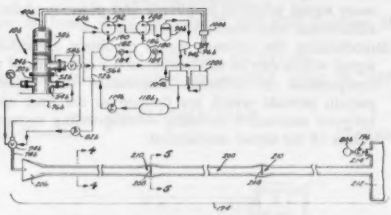
Int. Cl.² F03G 7/00

U.S. Cl. 60—641 **16 Claims**

1. The method of returning hot geothermal brine from a geothermal brine production well back into the ground, which comprises the steps of:

flowing said brine through a long, open ditch proximate the surface of the ground,

lowering the temperature of said brine in said ditch so as to cause precipitation of minerals out of the brine in said ditch and thereby reduce the mineral concentration in said brine, and



reinjecting said brine of reduced mineral concentration back into the ground through a reinjection well.

4,112,746

OPTO-ELECTRONIC TENSILE TESTING SYSTEM

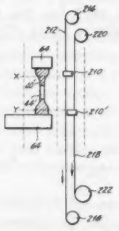
Hiroyuki Itoh, Kawasaki; Kenhachi Mitsuhashi, Hiratsuka, and Hiromitsu Akashi, Ise, all of Japan, assignors to The Yokohama Rubber Co., Ltd. and Fuji Telecasting Co., Ltd., both of, Japan

Filed Mar. 29, 1977, Ser. No. 782,492

Claims priority, application Japan, Apr. 2, 1976, 51-37541; Jun. 10, 1976, 51-68058; Oct. 6, 1976, 51-120180; Oct. 29, 1976, 51-131088; Jan. 20, 1977, 52-5214

Int. Cl.² G01N 3/08

U.S. Cl. 73—95 **25 Claims**



1. A tensile testing system for opto-electronically indicating the stress-strain properties of materials under tension comprising, in combination, scanning means for scanning a test specimen made of a material being tensile tested and a test region of the test specimen subjected to elongation by pulling stresses during tensile testing and for detecting and converting to an electrical output signal an optical characteristic of the test region different from other optical characteristics of other surfaces of the test specimen and developing said output signal as elongation of the test region progresses, circuit means receptive of said output signal for deriving therefrom portions thereof representative of the increasing length of the test region during elongation thereof and said scanning means comprising an area scanner developing a two-dimensional scene including the test specimen.

4,112,747

REAL-TIME RECORDING OF FATIGUE DAMAGE

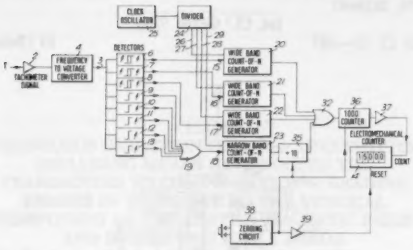
Trevor John Aldridge, Aston-on-Trent; Alan Howard Lock, Belper, and Robert Martin Alistair Bell, Borrowash, all of England, assignors to Rolls-Royce Limited, London, England

Filed May 17, 1977, Ser. No. 797,803

Claims priority, application United Kingdom, May 22, 1976, 21303/76

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—116 16 Claims



1. A method for real-time recording of elapsed fatigue life of a component of a rotary machine which is cyclically stressed as its rotational speed is cyclically varied, in which the rotational speed of the component is continuously monitored during its operation and each time the speed cycles through any one or more of a plurality of predetermined wide speed bands and any one or more of a plurality of predetermined narrow speed bands wherein each of the speed bands is defining a different operational speed cycle of said component of the rotary machine, a corresponding predetermined number of fatigue life units is added to an accumulating total of such units, the value of said number depending upon which band or bands are concerned in accordance with known empirically or theoretically deduced data.

4,112,748

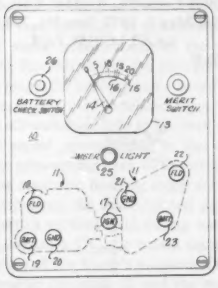
AUTOMATIC PORTABLE SOLID STATE VOLTAGE REGULATOR TESTER

Richard J. Walley, 6392 Marshall Ave., Buena Park, Calif. 90621

Filed Jun. 8, 1977, Ser. No. 804,724

Int. Cl.[2] G01M *19/00*

U.S. Cl. 73—118 4 Claims



1. A battery powered voltage regulator tester wherein the batteries provide a source of potential, including a plurality of contacts spaced to fit the particular regulator under test, a switch to apply the potential to the regulator comprising a pressure operated blade and a plurality of normally open contacts, and a capacitance and a bulb connected across a pair of said switch contacts wherein the capacitance developed in testing is discharged through the bulb to flash said bulb when said switch is deactivated, and a meter which indicates the amount of potential used by the regulator.

4,112,749

WRENCHES AND OTHER HAND TOOLS

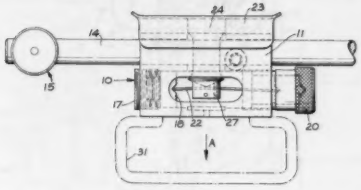
Norman Linfoot Smyth, Sheffield, England, assignor to Britool Limited, West Midlands, England

Filed Jan. 7, 1977, Ser. No. 757,569

Claims priority, application United Kingdom, Jan. 14, 1976, 1294/76

Int. Cl.[2] B25B *23/142*

U.S. Cl. 73—139 8 Claims



1. A torque unit for use on a lever handle of a wrench or the like including a body member provided with releasable clamping means for rigid attachment thereof to said handle so as to maintain said member at a selected distance along said handle from the axis of rotation of an element to be engaged and turned by the wrench in use and in predetermined relationship to the plane in which said handle moves about said axis in use; a second member operatively connected to said body member and guided for rectilinear movement relative to the body member substantially in said plane in a direction normal to said lever handle through which member a turning moment is applied to said handle by a user in use; resilient means exerting force biasing the second member in opposition to said turning moment; and warning means actuated by displacement of said second member in opposition to said force when the load transmitted by the resilient means exceeds a predetermined level for giving a signal to be sensed by the user; said resilient means comprising a leaf spring adapted to be intermediately engaged by said second member bowed so that it snaps over centre under predetermined lateral pressure applied by the second member, and said spring also comprising part of said warning means.

4,112,750

HOOK DEVICE

Sakae Murakami, Fukuyama, assignor to Nippon Hoist Co., Ltd., Hiroshima, Japan

Filed Aug. 12, 1976, Ser. No. 713,803

Claims priority, application Japan, Aug. 12, 1975, 50/111377[U]

Int. Cl.[2] B66C *1/40;* G01L *5/00*

U.S. Cl. 73—141 AB 4 Claims

1. Hook device applicable to a crane, a hoist or the like device characterized by that said hook device comprises:

(a) a support means for supporting a hook,

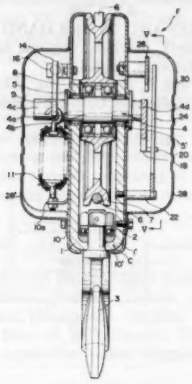
(b) an eccentric shaft mounted rotatably on said support means,

(c) a pulley arranged rotatably on the eccentric portion of said eccentric shaft,

(d) a spring means connected to said shaft for urging said eccentric shaft in a specific direction, and

(e) a load indicating means connected to said eccentric shaft, said load indicating means being operable by rotation of said eccentric shaft when a load in excess of a predetermined weight is applied to said shaft, said load indicating means comprising an arm set fast to said eccentric shaft,

two pins studded onto said arm, a pointer arranged rotatably on said support means, said pointer being between said pins for engagement with said pins whereby rotation of said shaft causes said pins to move with the movement



of said pins thereby causing said pointer to rotate, an indication plate set fast to said support means, and said indication plate being located corresponding to the range of rotation of said pointer.

4,112,751

ARRANGEMENT FOR MEASURING A RADIAL FORCE APPLIED TO A BEARING

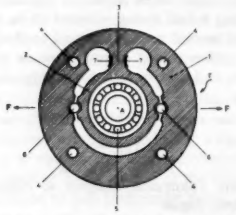
Heinrich Grünbaum, Am Bollwerk 6, CH-4102 Binningen, Switzerland

Filed Jun. 24, 1977, Ser. No. 809,515

Claims priority, application Switzerland, Jun. 28, 1976, 008323/76

Int. Cl.² G01L *5/10*

U.S. Cl. 75—141 A **7 Claims**



1. A bearing mounting unit for measuring a radial force applied to the mounted bearing, said unit comprising a unitary bearing mounting member having an outer annular portion and an inner annular portion surrounded by said outer annular portion ad defining therewith an annular gap, and a web extending across said gap and being of one piece with said portions so as to support said inner annular portion with freedom of radial displacement relative to said outer annular portion, said inner annular portion having an inner circumferential surface for receiving and retaining therein a rolling contact bearing, said inner and outer annular portions having respective faces which together bound said gap and which are provided at diametrically opposite locations with sets of concave recesses having open sides facing one another across said gap; a pair of overload protecting pins each received in one of said sets of concave recesses and extending parallel to one another and to a central axis of said member; and means mounted on the web for originating and transmitting signals commensurate with the stressing of said web resulting from the radial displacement of said inner annular portion relative to said outer annular portion.

4,112,752

APPARATUS FOR MEASURING SEVERAL FORCE COMPONENTS

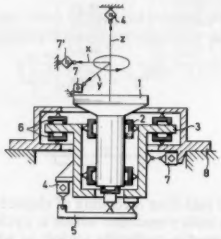
Hans Wilhelm Hüfner, and Frieder Pfister, both of Augsburg, Germany, assignors to Pfister Waagen GmbH, Germany

Filed May 11, 1977, Ser. No. 795,707

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624647

Int. Cl.² G01M *9/00*

U.S. Cl. 73—147 **11 Claims**



1. An apparatus for measuring several force components exerted by a flowing medium on a measuring object, comprising an object carrier to which the measuring object is fixedly connected and which provides the force components to be measured, said object carrier being arranged in a bearing system means for allowing movement in the directions of the force components, said bearing system means including a first guide arrangement positioned for movement in a second guide arrangement, said object carrier being restrained in the directions of the force components by force measuring devices, the bearing system means being arranged on an additional bearing system means for permitting a pivoting movement of the object carrier in all directions about the measuring object center point, the bearing system means on the additional bearing system means being restrained by force measuring devices, and the additional bearing system means and the bearing system means each having hydrostatic bearings.

4,112,753

METEOROLOGICAL MEASURING APPARATUS

David B. Call, 2998 Loma Pl., Boulder, Colo. 80301

Filed May 9, 1977, Ser. No. 794,936

Int. Cl.² G01W *1/08*

U.S. Cl. 73—170 R **19 Claims**

1. Apparatus for sensing meteorological conditions in the atmosphere comprising:

a central body of aerodynamic configuration containing meteorological instruments and including means for transmitting signals of conditions sensed by said meteorological instruments;

propeller means disposed at circumferentially spaced inter-

vals on said body, each of said propeller means inclining rearwardly away from said body and terminating in a tip end, said propeller means being operative to spin said apparatus about the central axis of said body; and

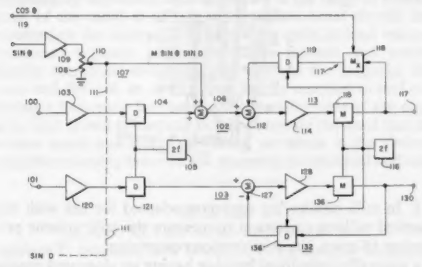
at least one temperature-sensing element disposed on at least one of said propeller means at a point spaced radially outwardly of the outer periphery of said body.

4,112,754

PENDULOUS INDUCTION COMPASS TRANSMITTER INCLUDING MEANS EXTERNAL TO THE TRANSMITTER TO COMPENSATE FOR HEADING ERRORS IN TURNS DUE TO THE VERTICAL COMPONENT OF THE EARTH'S MAGNETIC FIELD AND DUE TO TWO CYCLE ERROR

John Suminsby, 65 Arbor St., Wenham, Mass. 01984

Filed Dec. 20, 1976, Ser. No. 752,278
Int. Cl.[2] G01C *21/00*
U.S. Cl. 73—178 R **5 Claims**



1. In a pendulous induction compass transmitter compensated for errors due to the Earth's vertical field during turns, the combination comprising:

a. magnetic sensing means for producing modulated signals proportional to the strength of the Earth's field along the fore/aft and athwartships axes of an aircraft;

b. means to demodulate the modulated signal representative of the sensed fore/aft field to produce a varying, DC, demodulated signal proportional to the sensed Earth's field along the fore/aft axis of the aircraft and thus to the cosine of the magnetic heading angle ψ and of the aircraft;

c. means to demodulate the modulated signal representative of the sensed athwartships field to produce a varying, DC, demodulated signal proportional to the sensed Earth's field along the athwartships axis of the aircraft and thus to the sine of the magnetic heading angle ψ of the aircraft;

d. means to compensate the demodulated signals for errors due to the Earth's vertical field during turns, including;

1. means to generate a DC correction signal proportional to the product of the Earth's magnetic field M, the sine of the magnetic dip angle D and the sine of the bank angle ϕ,

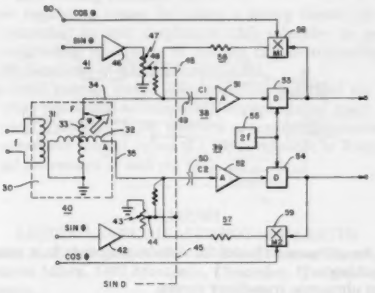
2. means to add said DC correcting signal algebraically to said demodulated DC signal proportional to the Earth's field and thus to the sine of the magnetic heading angle ψ to cancel the signal component due to the Earth's vertical field sensed along the athwartships axis during turns.

4,112,755

"STRAPDOWN" INDUCTION COMPASS TRANSMITTER WITH MEANS TO COMPENSATE FOR HEADING ERRORS DURING TURNS AND DURING DIVES AND CLIMBS DUE TO THE VERTICAL COMPONENT OF THE EARTH'S MAGNETIC FIELD AND DUE TO TWO CYCLE ERROR

Gerald Leslie Sullivan, 24 Scollay Cir., Salem, Rockingham, N.H. 03079

Filed Dec. 20, 1976, Ser. No. 752,064
Int. Cl.[2] G01C *21/00*
U.S. Cl. 73—178 R **5 Claims**



1. In a strapdown induction compass transmitter system compensated for errors due to the Earth's vertical field and for two cycle errors occurring during turns and during climbing and diving maneuvers, the combination comprising:

(a) magnetic sensing means for producing a first modulated signal responsive to the strength of the Earth's magnetic field along one axis of an aircraft, and a second modulated signal responsive to the strength of the Earth's magnetic field along another axis of the aircraft,

(b) means to compensate said signals for errors due to the Earth's vertical magnetic field during turns and while climbing and diving including:

(1) means to generate a first correction signal proportional to the product of the Earth's magnetic field M, the magnetic dip D, and the roll angle ϕ, said first correction signal being equal to the vertical field error in the magnetic field sensed along one of the axes of the aircraft during a turn,

(2) means to generate a second correction signal proportional to the product of the Earth's magnetic field M, the magnetic dip angle D and the pitch angle θ, said second correction signal being equal to the vertical field error in the magnetic field sensed along the other axis of the aircraft during climbing and diving maneuvers,

(3) means responsive to said first and second correction signals to produce flux fields which cancel the flux sensed by said magnetic sensing means along the respective axes of the aircraft due to the Earth's vertical field during turns and while climbing or diving,

(c) means for demodulating the compensated first and second modulated signals including,

(1) first and second demodulators each having inputs and outputs associated with the magnetic sensing means to produce respectively, first and second demodulated signals from said compensated first and second modulated signals,

(2) feedback paths from the outputs to the inputs of said first and second demodulators for producing negative feedback signals,

(d) and means to correct said first and second signals for two cycle error including means to reduce the negative feedback in one of said paths by a factor proportional to the cosine of the bank angle 100 **and the negative feedback in**

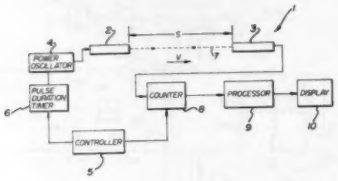
the remaining paths by a factor proportional to the pitch angle θ whereby the demodulated signals from the outputs of the demodulators are increased correspondingly to cancel two cycle error.

4,112,756

ULTRASONIC AIR DATA SYSTEM

P. H. Barry MacLennan, Almonte; Graham A. Ireland, Ottawa, and William J. Werba, Hazeldean, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 26, 1977, Ser. No. 828,225
Int. Cl.² G01P 5/00
U.S. Cl. 73—181 **13 Claims**



1. An ultrasonic system for determining data in a medium comprising:

first ultrasonic transducer means;

second ultrasonic transducer means positioned accoustically facing the first ultrasonic transducer means at a predetermined distance;

means for energizing the first transducer means to generate a controlled ultrasonic energy pulse for transmission through the medium to the second transducer means, a portion of the ultrasonic energy pulse incident on the second transducer means being reflected from the second transducer means to the first transducer means and back to the second transducer means through the medium, whereby the second transducer means provides successive output signals for successive ultrasonic energy pulse incidence; and

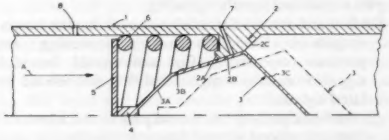
means coupled to the second transducer means for receiving the output signals to determine the ultrasonic energy pulse transit times from the first transducer to the second transducer and from the second transducer to the first transducer.

4,112,757

FLOWRATE METERS

Alan Thomas Joseph Hayward, East Kilbride, Scotland, assignor to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 8, 1977, Ser. No. 822,577
Claims priority, application United Kingdom, Aug. 16, 1976, 34062/76
Int. Cl.² G01F 1/22, 1/44
U.S. Cl. 73—207 **6 Claims**



1. A fluid flowrate meter comprising a duct through which, in use, the fluid of which the flowrate is to be measured flows in a given direction;

a control member mounted within the duct to define with the adjacent portion of the duct a convergent-divergent flowpath for the fluid, the control member and the adjacent portion of the duct comprising adjacent surfaces of complementary form between which the throat of said flowpath is defined, resilient biasing means coupled to said control member, the control member and the adjacent portion of the duct being relatively displaceable against said resilient biasing means in response to the flow of fluid through the duct and to an extent determined by the rate of such flow so that the cross-sectional area of said throat varies with the rate of fluid flow through the duct;

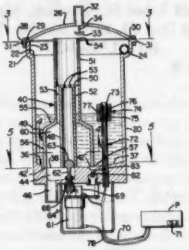
and means sensitive to the difference in static pressure between the throat of said convergent-divergent flowpath and a station upstream thereof for obtaining a measure of the rate of fluid flow through the duct.

4,112,758

MILK MONITORING METHOD AND APPARATUS

Robert F. Heidecker, Longmont, Colo., assignor to Dairy Systems, Inc., Longmont, Colo.

Filed Oct. 21, 1977, Ser. No. 844,369
Int. Cl.² G01F 11/10
U.S. Cl. 73—218 **28 Claims**



1. In milk monitoring apparatus adapted for use with mechanical milking equipment to measure the milk volume production of cows, the combination comprising:

a generally cylindrical housing having an elongated central axis, an inlet port adjacent to the upper end of said housing, flow guide means along the inner wall of said housing adjacent to the upper end to reduce the velocity of flow of milk from said inlet port into said housing;

a cover adapted to establish flush engagement with the upper edge of said housing, and sealing means interposed between the flat surface of said cover and the upper edge of said housing;

a bottom wall extending across the lower end of said housing provided with an upper surface including a first shallow recess formed in the surface and a second relatively deep recess in diametrically opposed relation to the first recess, said second recess communicating with a discharge port in said bottom wall;

rotor means centered in said housing with respect to said recesses, motive drive means including a drive shaft drivingly connected to said rotor means to impart rotation to said rotor means within said housing at a predetermined rate of speed, said rotor means divided into a plurality of compartments at equally spaced circumferential intervals in open communication with the upper surface of said bottom wall, each compartment adapted to be filled with milk from the annular space between such rotor means and the cylindrical housing as it traverses said first recess and to be emptied of milk as it traverses said second recess;

a float member including first sensing means for sensing the level of milk in the annular space and to generate a signal energizing said motive drive means when the milk reaches a predetermined level in said annular space; and

second sensing means adapted to count the number of compartments traversing said second recess.

4,112,759

DEVICE FOR DETECTING THE SURFACE LEVEL OF MOLTEN METAL IN A MOLD

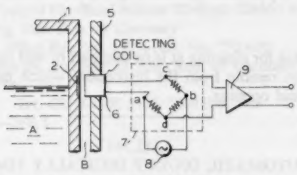
Michitaka Mizuno; Kazuo Ideue, and Masashi Oya, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 11, 1976, Ser. No. 741,019

Claims priority, application Japan, Nov. 20, 1975, 50-156854[U]

Int. Cl.[2] G01F *23/26*

U.S. Cl. 73—295 5 Claims



1. A device for detecting the surface level of molten metal in a mold, comprising at least one thermosensitive magnetic element which undergoes variations in the relative magnetic permeability depending on temperature in the range of temperature of the mold at all levels of molten metal therein and mounted on the outer wall surface of the mold, at least one coil positioned opposite to said magnetic element and spaced slightly therefrom to leave a gap between the magnetic element and the coil, an A.C. power supply coupled to said coil having a frequency for causing substantially none of the magnetic field of said at least one coil to penetrate the mold into the molten metal, and means of sensing variations in the electromagnetic coupling between the magnetic element and said coil.

4,112,760

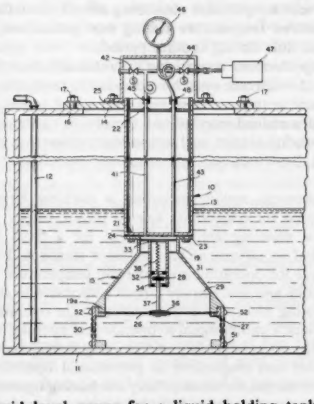
LIQUID LEVEL MEASURING DEVICE

Samford P. Ishiwata, New Rochelle, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,642

Int. Cl.[2] G01F *23/18*

U.S. Cl. 73—299 6 Claims



1. A liquid level gauge for a liquid holding tank which includes:

means forming a fluid tight pressure sensing chamber (29),

a flexible diaphragm member (26) defining a wall to said pressure sensing chamber (29), and being displaceable in response to a pressure imposed against either side thereof,

a casing (13) supportably engaging said pressure sensitive chamber (29), being adapted to position said chamber (29) in a liquid holding tank,

pressure control means communicated with said pressure sensing chamber (29) and including:

a source of pressure (47),

conduit means (41) having an electrically controlled valve (42) therein, being communicated with said pressure sensing means (47),

vent means including at least one electrically actuated fluid control valve (42) communicated with said pressure sensing chamber (29),

flow regulating means including a spring biased pin (37) connected to said diaphragm (26) whereby to permit longitudinal movement of said pin (37) corresponding to displacement of said diaphragm (26),

electrical contact means (28) depending from said pin (37), being positioned to selectively engage spaced apart electrical elements (32, 34) whereby to separately actuate said respective control valves (42, 44) in response to longitudinal movement of said pin (37).

4,112,761

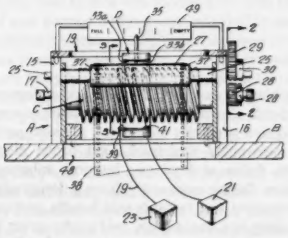
LIQUID LEVEL MEASURING APPARATUS

Bernard H. Engelhardt, 85 Colville Rd., Toronto, Ontario, and Marcus Mintz, 1493 Montcalm, Chomedey, Quebec, both of Canada

Continuation-in-part of Ser. No. 692,379, Jun. 3, 1976, Pat. No. 4,036,055. This application May 23, 1977, Ser. No. 799,231

Int. Cl.[2] G01F *23/08*

U.S. Cl. 73—312 8 Claims



1. Apparatus for measuring and recording increases and decreases in the magnitude or intensity of a variable, and comprising:

a record inscribing means and a record retaining carrying means, one of said means being adapted to define a substantially linear path of motion in two directions and comprising first drive means for driving said one of said means in said two directions;

the other one of said means being adapted to define a path of motion in a direction to intercept the linear path of motion, said other means comprising second drive means operable in one direction only;

transducer means for measuring said increases and decreases and translating said increases and decreases into two directional motion corresponding, respectively, with said increases and decreases;

linking means connecting the output of said transducer to said second drive means and to said first drive means such that an output in either direction of said transducer will cause a corresponding motion in either direction of said one means, whereas an output in one direction of said transducer will cause said other means to move in said one direction but an output in the other direction of said transducer will not cause said other means to move;

whereby,

when said magnitude of said variable changes in one way causing an output from said transducer in the other direction thereof, a first substantially straight line will be inscribed on said record retaining means by the motion of one means relative to said other means;

and

when said magnitude of said variable is changing in the other way causing an output from said transducer in the one direction thereof, a substantially straight line will be inscribed at an angle to said one straight line on said record retaining carrying means by the motion of both said one means and said other means.

4,112,762

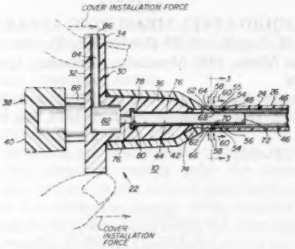
PROBE COVER GRIP AND RELEASE DEVICE

Robert Bruce Turner, Weymouth; Marvin Menzin, Lexington; Hugh A. Robinson, Wenham, and Thomas S. Williams, Newtonville, all of Mass., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Apr. 28, 1976, Ser. No. 681,348

Int. Cl.[2] G01K *1/08, 7/16*

U.S. Cl. 73—343 R **7 Claims**



1. In combination, a probe member and a disposable probe cover attachable thereto, said probe member having a handle and an elongated generally cylindrical metallic probe element depending outwardly therefrom, said probe element being deformed to define at least one integral, substantially rigid salient section flaring outwardly from a longitudinal axis of said probe element and towards said handle portion, said section terminating in a sharp edge, said probe cover being composed of a material deformable and penetrable relatively to the metallic material of said section, said handle portion including means for slidably inserting said probe element into said probe cover, said means for inserting forcing said probe cover to deform over said salient section and causing said sharp edge to inscribe itself fixedly into said probe cover, whereby said probe cover is rigidly mounted onto said probe member.

4,112,763

INSPECTING THE INTERIOR OF AN ENCLOSURE

Robert Alfred Pirlet, Embourg, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Jun. 30, 1976, Ser. No. 701,026

Claims priority, application Belgium, Jul. 1, 1975, 830895

Int. Cl.[2] G01J *5/04*

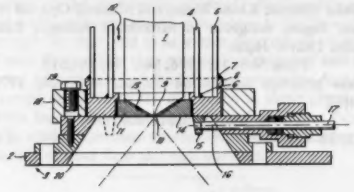
U.S. Cl. 73—355 R **7 Claims**

1. A device for inspecting the interior of an enclosure, comprising:

(a) an instrument for receiving radiation from the interior of the enclosure, the radiation being received through an orifice at one end of the instrument;

(b) a screen located immediately in front of the instrument a portion of said screen defining a surface interior to said enclosure, the screen having an opening in register with the said orifice, of the instrument said screen and said instrument defining a restricted space therebetween;

(c) means for passing a compressed gas through the space between the instrument and the screen and then through the opening in the screen; and



(d) means for cleaning at least that part of said surface of the screen remote from the instrument which part contains the said opening.

4,112,764

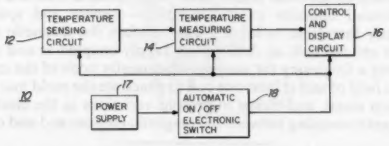
AUTOMATIC ON/OFF DIGITALLY TIMED ELECTRONIC SWITCH

Robert B. Turner, Weymouth, Mass., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 12, 1977, Ser. No. 758,618

Int. Cl.[2] G01K *7/16;* **H03K** *17/26*

U.S. Cl. 73—362 AR **5 Claims**



1. In an electronic thermometer system comprising:

power supply means;

a temperature measuring circuit for measuring temperature variations and providing a signal representative thereof;

normally open actuator switch means having a momentary closure property;

a time measuring circuit;

a display circuit responsive to said time measuring circuit and said temperature measuring circuit, for indicating the measured temperature during one period and the measured time during another period;

the improvement comprising an automatic on/off digitally timed electronic switch responsive to momentary closure of said actuator means to turn on and remain on for a predetermined interval and thereby to energize said time measuring circuit, said temperature measuring circuit, and said display circuit said automatic on/off switch including:

an electronic switch including a latching circuit means adapted for connection to said power supply means; interim enabling means activated for a fixed temporary period by closure of said actuator means; a drive circuit means for operating said time and temperature measuring circuits and said display circuit responsive to said interim enabling means to provisionally begin operating and to provide a gating signal to operate said latching circuit; and means interconnecting said latching circuit and said drive circuit and responsive to provisional operation of said drive means, for subsequently continuing operation of said drive circuit independent of the momentary enablement of said interim means; and,

a digital timer circuit including counting means successively responsive to momentary operation of said actuator, and

thence to said means for subsequently continuing, to begin counting and provide at a predetermined count an output to inhibit further operation of said drive circuit and deenergize said latching circuit.

4,112,765

EXPANSION DIAPHRAGM-TYPE TEMPERATURE SENSOR

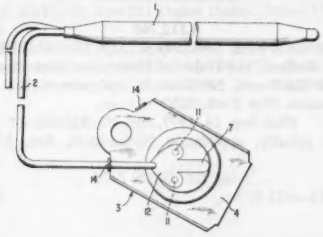
Walter Hollweck, Nuremberg, Fed. Rep. of Germany, assignor to Inter Control Hermann Köhler Elektrik GmbH & Co. KG, Nuremberg, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,600

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1976, 2608675

Int. Cl.² G01K *5/32*; H01H *37/40*

U.S. Cl. 73—368.3 **4 Claims**



1. In a temperature sensor including a liquid-filled sensor tube, an expansion diaphragm assembly and a capillary tube maintaining communication between the sensor tube and the diaphragm assembly for introducing into the diaphragm assembly temperature-dependent amounts of liquid for causing displacement of a diaphragm component to thereby actuate a switch; the improvement wherein said expansion diaphragm assembly comprises

(a) a substantially flat, stable carrier plate including a dished portion defining a cavity and having an opening;

(b) a substantially flat, circular, resilient, expandable diaphragm disc having a radially extending flat circumferential edge zone; said diaphragm disc extending over said cavity to define therewith an expansion chamber;

(c) a fluidtight weld in said edge zone for affixing said diaphragm disc along said edge zone to said carrier plate;

(d) a metal disc positioned in said expansion chamber generally parallel to said diaphragm disc; said metal disc having a perimeter engaging unbonded said carrier plate; and

(e) securing means for directly affixing said capillary tube to said dished portion; said capillary tube maintaining communication between said sensor tube and said expansion chamber; said securing means including

(2) means defining an elongated depression provided in a face of said dished portion orientated towards said diaphragm disc; said depression extending approximately parallel to said diaphragm disc; said opening of said dished portion being disposed at one end of said depression; a terminal portion of said capillary tube passing through said opening and being conformingly received by said depression; and

(2) means attaching said metal disc, inwardly of said perimeter, to said carrier plate and said terminal portion of said capillary tube.

4,112,766

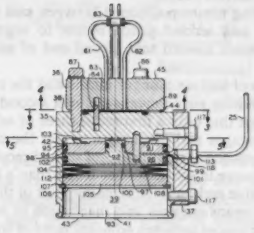
FLUID ACTUATED VALVE

Wilbur G. Ragains, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 21, 1977, Ser. No. 761,175

Int. Cl.² G01N *1/10*

U.S. Cl. 73—422 GC **15 Claims**



1. A two-position, fluid actuated, diaphragm-sealed valve, comprising in combination:

a unitary body having a planar surface at one end thereof and a cylindrical recess formed in the opposite end thereof with the central axis of said cylindrical recess being perpendicular to said planar surface, said cylindrical recess having a closed end and an open end;

a second body having a planar first face and an opposite face; said second body having a series of six spaced recesses arranged in a suitable array in said planar first face of said second body; said second body having first, second, third, and fourth spaced passageways formed therein communicating between a respective one of said spaced recesses on said planar first face of said second body and said opposite face of said second body; means adapted to provide fluid communication between the remaining two of said spaced recesses in said planar first face of said second body;

said unitary body having first, second, third, fourth, fifth and sixth linear passageways, with each said linear passageway extending perpendicularly from said planar surface to the closed end of said cylindrical recess;

a diaphragm positioned against said planar first face of said second body and encompassing the portion of said planar first face containing said spaced recesses;

means for releasably securing said second body to said unitary body with said planar surface facing said planar first face with said diaphragm positioned therebetween and with each said linear passageway being in alignment with the space between a respective pair of said spaced recesses;

six plunger means, with each plunger means being positioned in a respective one of said linear passageways;

closure means positioned adjacent the open end of said cylindrical recess to seal the open end of said cylindrical recess;

an annular piston means having an axial opening therethrough, said annular piston means being positioned in said cylindrical recess between said closure means and said closed end of said cylindrical recess for reciprocal movement along the central axis of said cylindrical recess in sealing engagement with the cylindrical wall of said cylindrical recess;

a second piston means positioned in said cylindrical recess between said closure means and said annular piston means for reciprocal movement along the central axis of said cylindrical recess in sealing engagement with the cylindrical wall of said cylindrical recess, said second piston means having an axially projecting section which extends from the main portion of said second piston means through said axial opening in said annular piston means, said second piston means and said annular piston means

being of such configuration that a first chamber is formed between said main portion of said second piston means and said annular piston means, said unitary body having a first fluid passageway extending therethrough which communicates with said first chamber;

first spring means positioned between said closed end of said cylindrical recess and said annular piston means to urge said annular piston means away from said closed end of said cylindrical recess;

second spring means positioned between said closure member and said second piston means to urge said second piston means toward said closed end of said cylindrical recess;

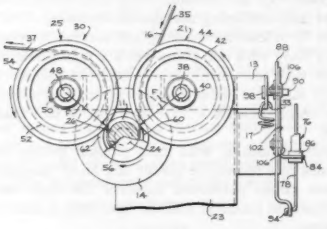
the lengths of said six plunger means and the configurations of said annular piston means and said second piston means being such that only a first set of three of said six plunger means engages said diaphragm to seal the corresponding spaces between adjacent pairs of spaced recesses when the fluid pressure in said chamber is less than a first predetermined value and only the remaining set of three of said six plunger means engages said diaphragm to seal the corresponding spaces between adjacent pairs of spaced recesses when the fluid pressure in said chamber is greater than a second predetermined value which is higher than said first predetermined value;

said unitary body having a second fluid passageway therethrough which communicates with a second chamber constituted by the portion of said cylindrical recess between said closure member and said second piston means, means for selectively applying fluid under pressure through said first fluid passageway to said first chamber to move said annular piston means toward said closed end of said cylindrical recess or through said second fluid passageway to said second chamber to move said second piston means toward said closed end of said cylindrical recess.

4,112,767
CLOTHES DRYER VARIABLE SPEED DRIVE SYSTEM

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 4, 1977, Ser. No. 784,605
Int. Cl.[2] F16H 7/12, 11/08
U.S. Cl. 74—217 R **6 Claims**



1. In a clothes dryer having a driven rotatable drum and a mechanism for transmitting torque between a driving rotatable member and the driven rotatable drum through an endless drive belt, the improvement comprising:

(a) the driving rotatable member having a first diameter area and a second diameter area, the first area having a greater diameter than the second area,

(b) two pulley assemblies, one being pivotable about the first diameter area and one pivotable about the second diameter area and each assembly including two pulleys with outside diameter flanges, reduced interior diameters, and having their longitudinal axes of rotation parallel and spaced a fixed distance apart by a spacing member secured to each pulley at their respective axes of rotation; the driving member having its longitudinal axis of rotation parallel to the rotational axes of the pulleys and arranged in a wedge-like relationship therebetween, the flanges of each pulley being in contact with the driving member;

(c) a drive belt for each pulley assembly passing over the respective first and second areas of the driving member and then over the reduced interior diameters of both of the flanged pulleys of the respective assemblies; and

(d) a shift mechanism to provide three modes of drum operation including;

(i) means to transmit torque from the first driving member area through its pulley assembly and belt to the drum causing the belt around the second driving member area to slip,

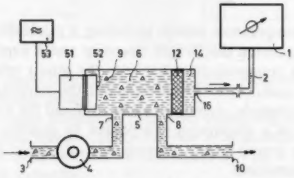
(ii) means to rotate the pulley assembly about the first driving member area opposite the direction of rotation of the driving member thereby causing the belt to slip while torque is transmitted to the drum from the second driving member through its pulley assembly and belt, and

(iii) means to rotate both pulley assemblies simultaneously about the driving member opposite the direction of rotation of the driving member to cause both belts to slip whereby no torque is transmitted to the drum.

4,112,768
DEVICE FOR TAKING A LIQUID SAMPLE

Johannes Holland, and Hubertus Franciscus Marie Wagemans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1977, Ser. No. 833,153
Claims priority, application Netherlands, Sep. 17, 1976, 7610352
Int. Cl.[2] G01N 1/14
U.S. Cl. 73—422 R **4 Claims**



1. Apparatus for taking a liquid sample from a contaminated liquid stream, which comprises a first compartment having an inlet and an outlet for the contaminated liquid stream, a second compartment having an outlet for the liquid sample, a filtering element separating the first compartment and the second compartment from each other, and an ultrasonic generator associated with said compartments for effecting cleaning of the filtering element by means of ultrasonic vibrations generated in the liquid.

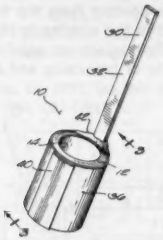
4,112,769
MOLTEN METAL DIP SAMPLER

Richard A. Falk, 519 Westminster Dr., Waukesha, Wis. 53186

Filed Jun. 22, 1977, Ser. No. 808,850
Int. Cl.[2] G01N 1/12
U.S. Cl. 73—425.4 R **2 Claims**

1. A molten metal dip sampler comprising a refractory cup having wall means having an exterior surface and an interior surface and an end surface, said wall means defining a sample cavity, a refractory bottom wall for said cup providing a bottom for said sample cavity, a metal handle for manipulating said sampler, said handle comprising a relatively thin elongated handle portion and an inturned portion and paperboard sleeve skull preventing means on said exterior surface of said wall

means to prevent skull formation on said wall and for securing said elongated handle portion in abutting contact along the



entire length of said exterior surface of said cup and said inturned portion extending beneath a refractory bottom wall to support said refractory cup on said inturned portion.

4,112,770

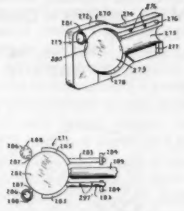
MOLTEN METAL SAMPLER

Robert F. McDevitt, Box 551 Ogden Dunes, Ogden Dunes, Ind. 46368

Division of Ser. No. 720,697, Sep. 7, 1976, which is a continuation of Ser. No. 565,396, Apr. 4, 1975, abandoned. This application Apr. 29, 1977, Ser. No. 792,394

Int. Cl.[2] G01N *1/12*

U.S. Cl. 73—425.4 R **27 Claims**



1. A device for obtaining a sample of liquid from a supply thereof, said device comprising a pair of elongated mating sections, each of said sections being provided with an enlarged portion provided with a recess and a smaller channel portion, means securing said enlarged portions together and means securing said channel portions together whereby said recesses and said channel portions respectively form a chamber and an elongated opening, said enlarged portions also having external side surfaces and cavities, inner passages connecting these cavities with said chamber for receiving fluid therefrom and outer passages venting said cavities at said surfaces, and a tube having an inner extremity secured in said opening and an outer extremity provided with an entrance for a liquid for flow into said chamber via said tube.

4,112,771

DEVICE FOR RECEIVING A SAMPLE OF MOLTEN METAL

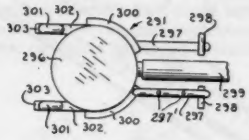
Robert F. McDevitt, Box 551, Ogden Dunes, Portage, Ind. 46368

Division of Ser. No. 720,697, Sep. 7, 1976, and a continuation of Ser. No. 565,396, Apr. 7, 1975, abandoned. This application Apr. 29, 1977, Ser. No. 792,395

Int. Cl.[2] G01N *1/12*

U.S. Cl. 73—425.4 R **23 Claims**

1. A device for obtaining a sample of molten liquid from a supply thereof, said device comprising a pair of elongated half sections, each of said sections being provided with an enlarged portion provided with a primary recess and outer relatively thick corner areas provided with elongated grooves which are enlarged intermediate their ends to provide a cavity, means securing said sections together whereby said recesses, grooves and cavities respectively form a primary chamber, a pair of



passages and a pair of secondary chambers, and tubular means through which the liquid may flow into said chambers and through said passages whereby a solid sample may be obtained which has a head portion and a pair of elongated portions extending therefrom which are disposed in a generally parallel relation to said tubular means.

4,112,772

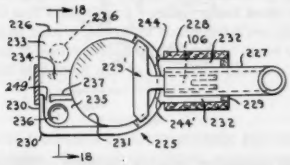
DEVICE AND METHOD FOR OBTAINING A SAMPLE OF LIQUID

Robert F. McDevitt, Box 551, Ogden Dunes, Portage, Ind. 46368

Continuation of Ser. No. 565,396, Apr. 7, 1975, abandoned. This application Sep. 7, 1976, Ser. No. 720,697

Int. Cl.[2] G01N *1/12*

U.S. Cl. 73—425.4 R **30 Claims**



1. A device for obtaining a sample of liquid from a stream thereof, said device comprising a pair of elongated half sections, each of said sections being provided with an enlarged portion provided with a recess and a smaller channel portion, generally U-shaped clip means securing said enlarged portions together and means securing said channel portions together whereby said recesses and said channel portions respectively form a chamber and an elongated opening, and a tube having an inner extremity secured in said opening and an outer extremity provided with an entrance for a liquid for flow into said chamber via said tube.

4,112,773

ULTRASONIC PARTICULATE SENSING

Leigh Roy Abts, Providence, R.I., assignor to Rhode Island Hospital, Providence, R.I.

Filed May 2, 1977, Ser. No. 792,669

Int. Cl.[2] G01N *29/02*; B06B *3/04*

U.S. Cl. 73—642 **8 Claims**

1. A pulse echo device comprising

a conduit,

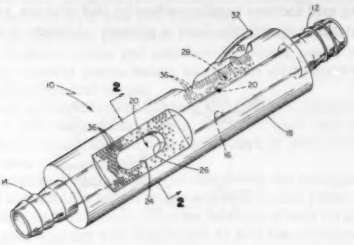
said conduit including a blind hole and

an inwardly concave transmitter-receiver surface, and

an acoustical transducer mounted in said blind hole for delivering ultrasonic energy through said transmitter-receiver surface,

said transmitter-receiver surface being located to serve as a lens for and to thereby focus said ultrasonic energy to

a focal point at a distance transversely of said conduit, in a direction from said transmitter-receiver surface



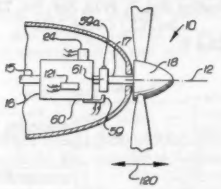
toward said focal point, of not more than twice the distance in said direction across said conduit.

4,112,774

AIRCRAFT ROTOR OUT-OF-TRACK CORRECTION METHOD AND APPARATUS

James R. Chadwick, Bradbury, Calif., assignor to Chadwick-Helmuth Company, Inc., Monrovia, Calif.

Filed Jan. 7, 1977, Ser. No. 757,622
Int. Cl.[2] G01M *1/22, 1/28, 9/00*
U.S. Cl. 73—455 **25 Claims**



1. In the method of reducing vibration produced by rotation of a bladed rotor having multiple blades with adjustable pitch angles, and wherein structure associated with the rotor is subject to vibratory motion due to an out-of-track condition of the blades, the steps that include:

(a) rotating the rotor at a selected power level, at which vibration is produced,

(b) detecting an out-of-track condition of a blade being rotated at that power level,

(c) repeating said (a) and (b) steps, but at another selected power level at which said vibration is also produced,

(d) said detection being carried out to detect at each power level the magnitude of out-of-track of a selected blade and its characteristic angularity about the blade axis at which said magnitude of out-of-track occurs, and

(e) adjusting the pitch angle of the blade in a direction to reduce said out-of-track condition.

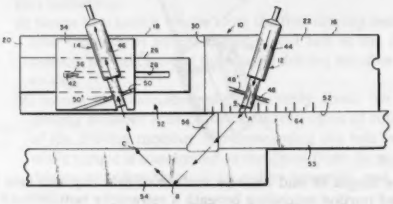
4,112,775

FILLET WELD INSPECTION SYSTEM

Bruce J. Sylvester, Duxbury, and Roger P. Sylvester, Kingston, both of Mass., assignors to J. G. Sylvester Associates, Inc., Rockland, Mass.

Filed Apr. 28, 1977, Ser. No. 792,063
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—627 **9 Claims**

1. An instrument for detecting defects in lap welds comprising a rigid, elongate block having a bottom planar surface and containing a recess in its front side which extends from one end to substantially the midlength of the block, said unrecessed portion of the block containing an opening from the top to the bottom, a first transducer mounted in said opening, a carriage block slidably mounted to the block in the unrecess for linear movement relative to the unrecessed portion, said carriage block containing an opening from top to bottom, a second transducer mounted in the opening in the carriage block in alignment with the first transducer, said first and second transducers being capable of generating and detecting ultrasonic



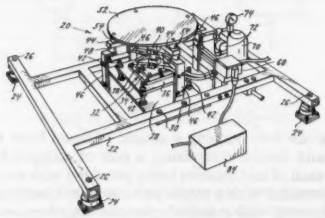
beams, and means for adjusting the distance between the transducers by movement of the carriage block in the recess relative to the unrecessed portion of the block, said openings being inclined to the bottom planar surface at converging angles corresponding to the angles of incidence and refraction of the ultrasonic beams transmitted through the couplant medium with which the instrument is to be used.

4,112,776

EARTHQUAKE SIMULATOR

Joseph Fernand Ouellette, Glendale, and David L. Poeling, St. Charles, both of Mo., assignors to Quellette Machinery Systems, Inc., St. Louis, Mo.

Filed Sep. 30, 1976, Ser. No. 728,126
Int. Cl.[2] B06B *1/14*
U.S. Cl. 73—665 **1 Claim**



1. A device to vibrate a surface having a frame, means in the frame mounting a plate, the mounting means including a first resilient mount connected to the plate, the resilient mount being connected to a driving lever, the driving lever being connected at one end to a second resilient mount and the second resilient mount being connected to a damping support connected to the frame, the driving lever being connected at a second end to a driving piston, the piston having a power cylinder capable of reciprocating the piston at a preselected frequency and thereby oscillating the driving lever to thereby oscillate the plate through the first resilient mount, the first and second resilient mounts being positioned to reduce the amplitude of the oscillations of the plate relative to the oscillations of the reciprocating piston, the power cylinder being mounted on a shock absorbing plate having a plurality of layers, at least two of the layers having different vibrational modes, the plate being mounted in the frame, valve means adapted to control a power source, the valve being connected to the power cylinder to actuate the cylinder at a preselected frequency in response to an input signal, means increasing the response sensitivity of the power cylinder, and a feedback cylinder connected to the plate to generate a positional feedback signal for

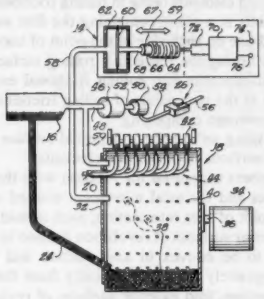
comparison with an input signal, the frame having shock absorbing means to absorb vibration transmitted to the frame.

4,112,777

AIR PRESSURE MONITOR

John T. Knepler, Chatham, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Jun. 30, 1977, Ser. No. 808,807
Int. Cl.[2] G01L *9/10*
U.S. Cl. 73—728 **9 Claims**



1. A fluid pressure monitor comprising electromechanical sensor means having a variable impedance which varies systematically according to the fluid pressure applied to said sensor means, circuit means connected to said sensor means for producing output signal means suitable for driving a digital display corresponding to said fluid pressure applied to said sensor means, said circuit means including first oscillator means connected to said sensor means for producing a pressure signal at a frequency proportional to said pressure in response to said impedance of said sensor means, second oscillator means for producing a reference signal at a frequency corresponding to the frequency of said pressure signal produced by said first oscillator means when said pressure applied to said sensor means is substantially zero, mixer means connected to said first and second oscillator means for producing a difference signal at a frequency corresponding to the difference between the frequencies of said pressure and reference signals and signal conversion circuit means connected to said mixer means for converting said difference signal to produce said output signal means, said signal conversion circuit means including a trigger circuit connected to said mixer means for producing a plurality of pulses at substantially the same frequency as and in response to said difference signal and a divider circuit connected to said trigger circuit for decreasing the frequency of said pulses by a predetermined proportion to produce a divider circuit signal at a frequency suitable for driving a digital display so as to be readable, while maintaining a relatively high degree of resolution afforded by the proportionately higher frequencies of said first and second oscillator means.

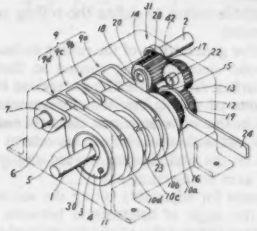
4,112,778

VARIABLE SPEED POWER TRANSMISSION

Akira Korosue, 19-6, Tashiro-cho, Nishinomiya, Hyogo, Japan

Filed Dec. 1, 1976, Ser. No. 746,341
Claims priority, application Japan, Dec. 2, 1975, 50/145792
Int. Cl.[2] F16H *29/04*
U.S. Cl. 74—117 **1 Claim**

1. In a variable speed power transmission having a rotary unit comprising an inner eccentric cam secured to an input axis, an outer eccentric cam mounted on the periphery of said inner eccentric cam, a connecting link on the input side having at its one end a round hole rotatably fitted to the periphery of said outer eccentric cam, a one-way rotary mechanism fixed to the output axis, a connecting link on the output side with its one end fixed to the periphery of said one-way rotary mechanism; the other end portions of said connecting links on the input side and on the output side are connected rotatably with each other by means of a connecting pin, a plurality of sets of said rotary units with a phase angle difference therebetween are mounted on said input axis and said output axis with the fixed space therebetween, a synchronous slit plate with a slit in diametrical direction is rotatably fixed to the input axis and adjacent each outer eccentric cam, said synchronous slit plate, the outer eccentric cam and a succeeding synchronous plate



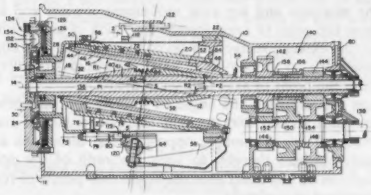
are connected together by a synchronous pin through an axial hole in the outer eccentric cam and a slit of each synchronous slit plate, and a phase angle regulating mechanism including a gear rotatable with said input axis, a gear rotatable about said input axis and secured to one said synchronous slit plate, a variable eccentric gear train drive from said gear rotatable with said input axis to said rotatable about said input axis including a drive gear with a fixed axis driven by said gear rotatable with said input axis, a variable speed lever rotatable about said input axis, a moveable eccentric drive means and linkages linked to said variable speed lever to move said gear rotatable about said input axis to change its phase.

4,112,779

VARIABLE SPEED TRANSMISSION DEVICE

Yves Jean Kemper, Birmingham, Mich., and Lucien Bigot, Nantes, France, assignors to Vadetec Corporation, Troy, Mich.

Filed Nov. 3, 1976, Ser. No. 738,472
Int. Cl.[2] F16H *15/16*
U.S. Cl. 74—191 **30 Claims**



1. In a variable speed transmission having a frame, drive input means, drive output means, and means interconnecting the input and output means including a first element having a first axis fixed relative to the frame, a second element having concentric rolling and journal surfaces of revolution about a second axis intersecting the first axis at a point of axes intersection, a third element journalled in the frame for rotation on the first axis and having journal means to engage the journal surfaces of the second element and support the second element to positively establish an angle of intersection between the first and second axes during movement of the second axis in a biconical path circumferentially about the first axis, the first

element having a pair of rolling surfaces of revolution about the first axis, one on each side of the point of axes intersection, the rolling surfaces of the second element being disposed also one on each side of the point of axes intersection, the respective rolling surfaces on the first and second elements being in rolling frictional engagement at two points in a plane containing the first and second axes and located one on each side of the point of axes intersection, and means urging the respective rolling surfaces on the first and second elements into rolling frictional engagement with each other at the two points of rolling frictional engagement, the improvement comprising:

axially fixed means to define the rolling surfaces of the second element;

axially shiftable means to define the rolling surfaces of the first element;

the respective generatrices of the rolling surfaces on the first and second elements being shaped so that the ratio of rolling surface radii on the first and second elements at the two points of rolling friction engagement varies with changes in the angle at which the first and second axes intersect and with axial shifting movement of the rolling surfaces on the first element toward and away from the point of axes intersection; and

control means for adjustably tilting the second element to change the angle of intersection between the first and second axes and thereby adjust the ratio of rolling surface radii on the first and second elements at the two points of rolling friction engagement.

9. In a transmission device having a frame, drive input means, drive output means, and means interconnecting the input and output means including a first element having a first axis fixed relative to the frame, a second element having a second axis intersecting the first axis at a point of axes intersection, support means rotatable on the first axis and rotatably supporting the second element for conical movement about the point of axes intersection and circumferentially of the first axis, the first element having a pair of rolling surfaces disposed about the first axis, one on each side of the point of axes intersection, the second element having a pair of rolling surfaces disposed about the second axis, one on each side of the point of axes intersection, the respective rolling surfaces on the first and second elements being in rolling frictional engagement at two points in a plane containing the first and second axes and located one on each side of the point of axes intersection, and means urging the respective rolling surfaces on the first and second elements into rolling friction engagement with each other at the points of rolling frictional engagement, the improvement comprising:

means establishing an interior cylindrical surface to define the rolling surfaces of one of the elements;

a pair of members supported for rotation with the other of the elements and for axial movement toward and away from the point of axes intersection, each of said members having exterior surfaces of revolution defined by a curved generatrix to be convex in axial section and converging from the point of axes intersection; and

means for adjusting the angle of intersection between the first and second axes to shift the two points of rolling frictional engagement in opposite axial directions along said members thereby to vary the radii of the rolling surfaces on the other element at the two points of rolling frictional engagement.

4,112,780

VARIABLE SPEED TRANSMISSION DEVICE

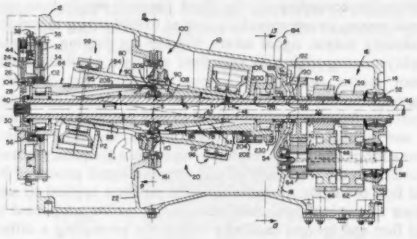
Yves Jean Kemper, Birmingham, Mich., and Lucien Bigot, Nantes, France, assignors to Vadetec Corporation, Troy, Mich.

Filed Apr. 1, 1977, Ser. No. 783,776
Int. Cl.[2] F16H *15/06, 15/16*
U.S. Cl. 74—191 **23 Claims**

1. In a variable speed transmission having a frame, drive input means, drive output means, and means interconnecting the input and output means including a first element having a first axis fixed relative to the frame, a second element having concentric rolling and journal surfaces of revolution about a second axis intersecting the first axis at a point of axes intersection, a third element rotatable on the first axis and having journal means to engage the journal surfaces of the second element during movement of the second axis in a biconical path circumferentially about the first axis, the first element having a pair of rolling surfaces disposed about the first axis, one on each side of the point of axes intersection, the rolling surfaces of the second element being disposed also one on each side of the point of axes intersection, the respective rolling surfaces on the first and second elements being in rolling frictional engagement at two points in a plane containing the first and second axes and located one on each side of the point of axes intersection, and means urging the respective rolling surfaces on the first and second elements into rolling frictional engagement with each other at the two points of rolling frictional engagement, the improvement comprising:

means establishing an interior cylindrical surface to define the rolling surfaces of one of the elements;

a pair of members supported for rotation with the other of the elements and for axial movement toward and away from the point of axes intersection, each of said members having exterior surfaces of revolution defined by a curved generatrix to be convex in axial section and generally inclined oppositely and symmetrically from the point of axes intersection, said exterior surfaces of revolution establishing the rolling surfaces on the other of the elements;



means defining the third element and including a sleeve-like member extending between the rolling surfaces of the first and second elements and having openings to enable the rolling frictional engagement of the respective rolling surfaces at the two points containing the first and second axes; and

means carried by the third element for adjusting the angle of intersection between the first and second axes to shift the two points of rolling frictional engagement in opposite axial directions along said member thereby to vary the radii of the rolling surfaces on the other element at the two points of rolling frictional engagement.

2. The apparatus recited in claim 1, wherein said interior cylindrical surface establishing means defines the rolling surfaces of the second element and the first element includes said pair of members.

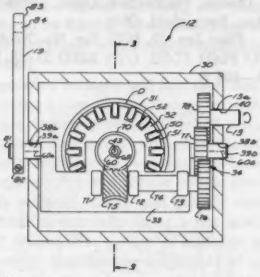
3. The apparatus recited in claim 2, wherein the journal means of the third element are located at opposite ends of the second element and movable in diametrically opposite directions relative to the third member, and including a pair of piston/cylinder devices for positioning the journal means symmetrically about the point of axes intersection.

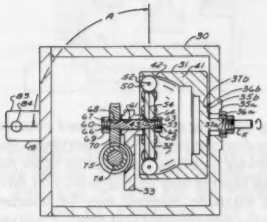
4. The apparatus recited in claim 3, wherein said piston/cylinder devices comprise cylinder defining means carried by said sleeve-like member and a piston operable in said cylinder and fixed to the journal means.

4,112,781
ROTATIONAL SPEED REDUCTION AND REVERSING MECHANISMS

Benton F. Baugh, 14626 Oak Bend, Houston, Tex. 77079

Filed Jul. 9, 1976, Ser. No. 704,030
Int. Cl.[2] F16H *13/04, 17/02, 17/00*
U.S. Cl. 74—198 5 Claims





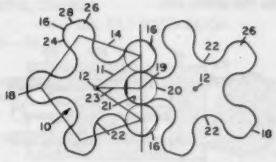
1. A rotational speed changing mechanism comprised of: a first rotating member with an internal spherical surface mounted for rotation; a second rotating member mounted for rotation with a plurality of rollers spaced around its circumference; said rollers mounted to turn about their individual axis and to contact the internal spherical surface of the first member in such a manner that the second member may rotate on the internal surface of the first member; a housing provided with mounting means for pivoting the second member in relation to the first member and near the center of rotation of the first member; said second member pivotably mounted on said housing so as to rotate about an axis in such a fashion as to maintain contact between one or more of said rollers on the second member and the spherical internal surface of the first member; and an output gear train provided to allow the output drive axis of the second member to be rotated about the pivoting axis of the mounting means while also allowing the power output of the rotational speed changing mechanism to be set off at a 90° angle to the power input.

4,112,782
COMPATIBLE GEAR SYSTEM

Max Mullins, c/o Mrs. Nel Mullins, 1370 NE. Miami Court, Miami, Fla. 33161

Filed Jun. 21, 1977, Ser. No. 808,469
Int. Cl.[2] F16H *55/06*
U.S. Cl. 74—462 6 Claims

1. A compatible gear system wherein each gear (30, 32) has an odd number of teeth (26), five or more, the shape and size of the gear (30, 32) and gear teeth (26) being determined by laying out a regular polygon (10) with its corners (18) a pitch radius distance (23) from its center (12), thus being the pitch radius of the desired gear (30, 32), the polygon (10) having an odd number of sides (14) equal to the odd number of teeth (26) in the desired gear (30, 32), laying out circles (16) about each polygon corner (18) with a radius equal to one-fourth of the length of a polygon side (14), then laying out intermediate circles (20) tangent to and between said polygon corner centered circles (16) with the same radius, the intermediate circles (20) each

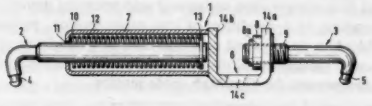


being centered at the mid-points (19) of its polygon side (14), the corner centered circles (16) defining gear teeth (26) that are greater than semi-circular and merge inwardly with the inner portions (21) of the intermediate circles (20) which define semi-circular gear teeth meshing recesses (22).

4,112,783
EXHAUST GAS RETURN VALVE ACTUATING ROD

Alfred Beier, Braunschweig-Hondelage, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 16, 1977, Ser. No. 777,893
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613781
Int. Cl.[2] G05G *1/00;* F16B *7/10*
U.S. Cl. 74—470 4 Claims



1. An exhaust gas control valve actuating rod comprising a first rod portion adapted for connection to an exhaust gas control valve, a second rod portion axially aligned with said first rod portion and adapted for connection to a throttle linkage, and a connecting element, including a U-shaped section having arms extending perpendicular to the axis of said first and second rod portions, one of said arms having a threaded insert having a self-locking thread into which one of said rod portions is threaded for changing the length of said actuating rod, and the other of said arms being connected to the remaining rod portion by a spring connection, said connecting element extending eccentrically with respect to the axis of said first and second rod portions.

4,112,784
APPARATUS FOR PRODUCING MOTION OF A WORKPIECE

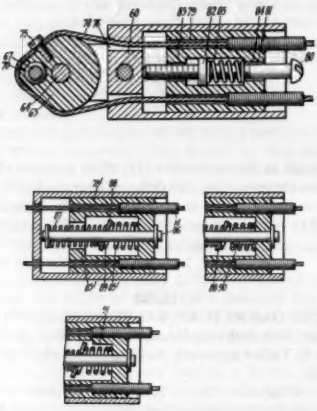
Harry Jose Cosh, 33 Wallace St., Bairnsdale Victoria, Australia

Filed Jun. 30, 1976, Ser. No. 701,419
Claims priority, application Australia, Jul. 4, 1975, 2230/75
Int. Cl.[2] F16C *1/22*
U.S. Cl. 74—501.5 R 6 Claims

1. A compensator for Bowden cables comprising
a housing having a hollow interior;
a block mounted in the hollow interior of the housing for movement relative to the housing in an axial direction only and being adapted to retain therein the outer sheath of a cable;
shaft means passing through the block in the axial direction and acting on an inner end wall of the housing;

a first compression spring mounted on the shaft inside the block;

a retaining device located on said shaft in a position that is adjustable with respect to said housing for holding said first compression spring against unwanted axial movement relative to the shaft; and



a primary adjusting means mounted on said shaft to provide for adjustment to allow for variations in cable length and size;

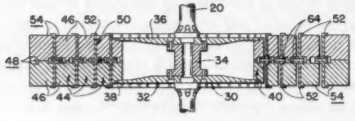
said first compression spring and said retaining device cooperating, in a condition of low cable tension, to bias the block in an outward direction and, in a condition of high cable tension, to allow the block to compress the spring to compensate for that high cable tension.

4,112,785

RING ASSEMBLY FOR INERTIAL ENERGY STORAGE ROTOR

William M. Brobeck, Orinda, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jul. 1, 1976, Ser. No. 701,826
Int. Cl.[2] F16C *15/00*
U.S. Cl. 74—572 **23 Claims**



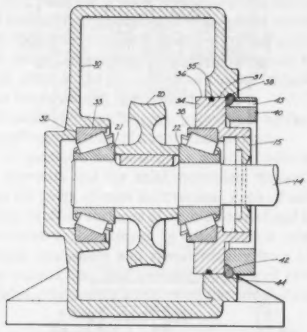
1. A rotor ring for use with an inertial energy storage wheel comprising: a plurality of coaxial rings having like inner and outer diameters, opposing faces of the rings including a plurality of circumferentially spaced apart, aligned grooves, each set of corresponding grooves defining a radially oriented, open hole; and a plurality of connecting members constraining the rings to each other, the members having a U-shaped configuration defined by a center section that is parallel to the axis of the rings and a pair of radially oriented lips disposed substantially perpendicular to the center section, the lips being spaced apart a distance substantially equal to the combined axial thickness of the rings, the member further including radially oriented plug means extending from the center section and having a configuration complementary to the holes; whereby the connecting members mutually align and constrain the rings to each other by inserting the plug means in the respective holes and engaging free end faces of the rings with the lips.

4,112,786

BOLTLESS HOUSING FOR GEAR HEADS AND THE LIKE

Richard J. Thomas, Wallingford, Conn., assignor to Robbins & Myers, Inc., Springfield, Ohio

Filed Jan. 19, 1977, Ser. No. 760,814
Int. Cl.[2] F16H *57/02, 1/16;* B21D *53/28;* F16C *1/06*
U.S. Cl. 74—606 R **4 Claims**



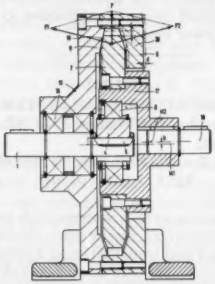
1. A housing containing a shaft-mounted rotatable element, said housing having one integral side carrying a shaft bearing, said housing having a circular bore on the other side, through which said shaft bearing may be emplaced, and through which said shaft and rotatable member may be inserted into said housing, a circular side plate for said housing carrying a second shaft bearing, said side plate fitting in said bore with very small clearance, an O-ring between said bore and side plate for sealing purposes, an internal annular groove in said bore, and an annular key filling said annular groove and having an annular portion exposed on the outside of said side plate, said key locking said side plate in position and being removable by machining, melting and the like for repair.

4,112,787

EPICYCLIC FRICTION TRANSMISSION WITH TORQUE-DEPENDENT PRESSURE-EXERTING DEVICE

Heinrich Tippmann, and Wolfgang Huber, both of Munich, Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 749,687
Int. Cl.[2] F16H *13/06, 15/56*
U.S. Cl. 74—798 **6 Claims**



1. An epicyclic, friction type, mechanical transmission in which a planet wheel makes a friction contact with the larger

diameter inside surface of a fixed sun wheel, said transmission having first and second independent shafts concentric with said sun wheel and said planet wheel, respectively, but having centers offset with respect to each other, the combination comprising:

means for transmitting torque between said first and second shafts, said second shaft being mechanically fixed to said planet wheel, said means including the circumferential force produced by friction between said sun wheel inside surface and said planet wheel rolling eccentrically within said sun wheel;

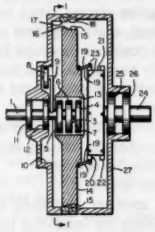
and means operative between said first shaft and said planet wheel including a cam surface associated with one of the two members consisting of said first shaft and said second shaft and a cam counterpart affixed to the other of said two members, said cam and counterparts being arranged to effectively resolve said torque couple into tangential and radially outward forces, said radially outward force being directed substantially along a line containing said offset shaft centers, the surface of said cam providing a wedging action such that the magnitude of said radially outward force is a direct function of the magnitude of said torque couple between said shafts.

4,112,788

TORQUE TRANSMISSION DEVICE

Albert Patrick Sfredda, 2106 Iris Pl., Bethlehem, Pa. 18018

Filed Aug. 24, 1976, Ser. No. 716,990
Int. Cl.[2] F16H *3/44, 1/28*
U.S. Cl. 74—804 **8 Claims**



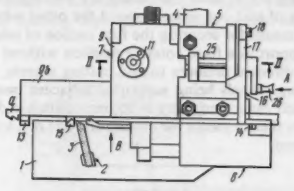
1. A torque transmission device comprising; a wheel having an inner concentric raceway, the rim of said wheel having a rolling surface and teeth formed about said rim, a fixed annular raceway having teeth formed about the path of said annular raceway, said annular raceway encircling and engaging said wheel, the diameter of said raceway being larger than the diameter of said wheel so as to permit wheel rotation thereon; said wheel teeth having a rolling drive interengagement with said raceway teeth thereby permitting positive wheel rotation on said annular raceway, a rotatably supported drive shaft positioned concentrically relative to said fixed annular raceway, a drive member secured to said drive shaft, said drive member engaging a portion of the inner raceway of said wheel, whereby rotation of said drive shaft will cause said drive member to impart a radial drive force to said wheel, a rotatably supported output shaft positioned concentrically to said drive shaft and coupling means connecting said output shaft to said wheel, whereby torque produced by the orbital rotation of said wheel is transmitted to said output shaft.

4,112,789

MACHINE FOR WORKING SAW TEETH

Vladimir Viktorovich Idel, selo Kolchino, ulitsa Kirova, 11, Zakarpatskaya oblast, Mukachevsky raion, U.S.S.R.

Filed Mar. 24, 1977, Ser. No. 781,016
Claims priority, application U.S.S.R., Mar. 30, 1976, 2333521; Mar. 30, 1976, 2333524
Int. Cl.[2] B23D *63/04*
U.S. Cl. 76—58 **25 Claims**



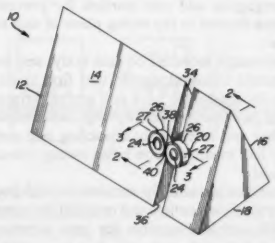
1. A machine for working band saw teeth, comprising: a bed; an abrasive wheel for sharpening band saw teeth, said abrasive wheel being mounted on said bed; means for rotating said abrasive wheel; a clamping device for holding the band saw involved on the side and back surfaces thereof, said clamping device being mounted on the bed and arranged to reciprocate for the purpose of feeding said band saw to the abrasive wheel; a driving mechanism of the machine; a mechanism for effecting reciprocating movement of said clamping device, said mechanism being kinematically connected with said driving mechanism of the machine; a band saw pitch-feed mechanism mounted on said clamping device and kinematically connected with said driving mechanism of the machine; at least two tooth tip supporting elements, one of them being located before said abrasive wheel, as viewed in the direction of pitch feed, and the other supporting element being mounted on said clamping device after said abrasive wheel, as viewed in the direction of pitch feed; at least two shaped surfaces formed on said other supporting element and arranged to make contact with the tips of the saw teeth, said other supporting element being mounted on said clamping device so as to be able to be moved relative thereto for the purpose of positioning said shaped surfaces so that the side surfaces of the tooth tips make contact with the appropriate shaped surfaces, whereby the saw teeth are set, the setting being performed only in the zone of the tooth tips.

4,112,790

KNIFE SHARPENER

William Z. Marder, North Wales, Pa., assignor to Zevco Enterprises, Inc., North Wales, Pa.

Filed Nov. 24, 1976, Ser. No. 744,588
Int. Cl.[2] B21K *5/12*
U.S. Cl. 76—87 **8 Claims**



1. A knife sharpener comprising:

a support;

a pair of axles attached to said support, each axle including

a first section and a second section, the transverse dimension of said second section being less than the transverse dimension of said first section;

a discrete cutting wheel having a bore journaled on the second section of each axle for rotary motion during the sharpening of a knife, the axis length of said second section being greater than the thickness of the blade at the bore;

means including a wrench engaging surface on the outer periphery of said first section for providing an eccentric mounting for at least one wheel for moving the axis of rotation of said one wheel toward the other wheel;

fastening means for securing the first section of said axles to said support in a fixed rotative position without applying axially directed pressure to said cutting wheels;

said cutting wheels being supported adjacent one another with their outer periphery in rolling contact and forming between them a means for cutting an edge of a knife being sharpened.

4,112,791

CABLE-STRIPPING TOOL

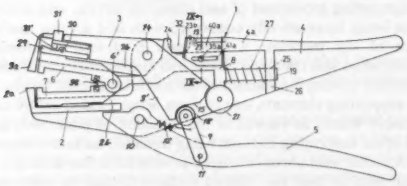
Hans Wiener, Täby, Sweden, assignor to C. A. Weidmuller KG, Detmold, Germany

Filed Nov. 10, 1976, Ser. No. 740,833

Claims priority, application United Kingdom, Nov. 11, 1975, 46580/75

Int. Cl.² H02G *1/12*

U.S. Cl. 81—9.5 A **10 Claims**



1. A tool for handling slender workpieces, comprising:

an elongate body provided at a front end thereof with a first gripping jaw and terminating at a rear end thereof in a first shank;

a second gripping jaw swingably mounted on said body, said gripping jaws being respectively provided with confronting first and second guide tracks extending rearwardly from a pair of cable-clamping extensions;

a first stripping jaw slidable along said first guide track;

a second stripping jaw articulated to said first stripping jaw and slidable along said second guide track;

a link member with a front portion, an intermediate portion and a rear portion slidable along said body in a longitudinal direction generally parallel to said first guide track, said front portion being positively coupled with said stripping jaws, said first shank being provided with restraining means engaging said rear portion for preventing lateral excursions thereof in the swing plane of said second gripping jaw;

a handle pivotally mounted on said body, said handle forming a second shank alongside said first shank and being operatively connected with said second gripping jaw and with said link member for moving said extensions toward each other and rearwardly retracting said stripping jaws and said link member upon being swung toward said first shank; and

a guide member detachably secured to said body close to said intermediate portion and coupled by coacting formations with said link member for joint removal from said body together with said stripping jaws, said formations enabling relative displacement of said members in said longitudinal direction while preventing such displacement in a direction transverse to said swing plane, said body being provided with abutment means engaging said guide member and preventing any relative displacement thereof, said intermediate portion having a projection provided with a rearwardly facing land confronting a forwardly facing land of said guide member across a laterally open recess narrowing upon rearward movement of said link member under the control of said handle, said recess being further bounded by a lateral land extending generally in said longitudinal direction, at least one of said lands having a cutting edge for biting into the insulation of a cable inserted into said recess.

4,112,792

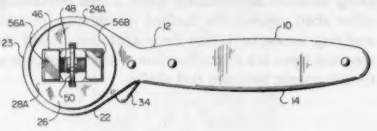
ADJUSTABLE RATCHET WRENCH

Henry L. Guimarin, 2812 Milam, Fort Worth, Tex. 76112

Filed Apr. 11, 1977, Ser. No. 786,505

Int. Cl.² B25B *13/46*

U.S. Cl. 81—63 **3 Claims**



1. An improved adjustable ratchet wrench comprising:

a body formed of two complementary side pieces and defining an elongated handle portion and two parallel, spaced apart members each terminating in a generally circular enlarged ratchet holding head;

a circular ratchet disk member having a plurality of ratchet teeth about its periphery and hub portions of reduced diameter extending from opposite sides;

each of said ratchet holding heads including a circular opening receiving a different one of the hub portion of said ratchet disk member, said openings being coaxial and supporting said ratchet disk member for rotation;

a generally triangular shaped pawl member mounted between said spaced apart members and pivotal between first and second positions in which first and second abutments selectively engage said ratchet teeth to selectively control the direction in which said ratchet disk member can be rotated;

spring means cooperatively associated with a third abutment of said pawl member for biasing said pawl member into said first and second positions;

a double acting lead screw;

said ratchet disk member including a centrally disposed rectangular opening for receiving the double acting lead screw;

said ratchet disk member including three portions positioned as three layers, one of the portions including an outer rim having the ratchet teeth formed therein, and the centrally disposed rectangular opening in the middle layer portion being larger than the centrally disposed rectangular openings in the two outermost layers so as to form a groove when the three portions are layered together, and means effective when the three portions are positioned in opposed relationship for preventing rotation of the portions relative to each other;

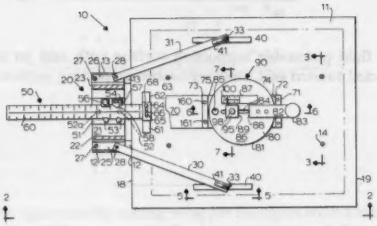
a pair of opposed jaw members each having a threaded base and carried by said lead screw for movement selectively toward and away from each other dependent upon the direction of rotation of the lead screw; said jaw members including outwardly extending flanges adapted to fit in the ratchet disk member groove; and

opposed faces of said jaw members including two obliquely angled planes defining a spread V shape extending from the free end of the jaw member toward said base a limited distance.

4,112,793
DEVICE FOR CUTTING OVALS IN MATS OR GLASS SHEETS

Donald Cameron Pierce, 1253 C Redwood Blvd., Novato, Calif. 94947

Filed Apr. 6, 1977, Ser. No. 785,244
Int. Cl.[2] B23B *41/04*; B41L *11/04*
U.S. Cl. 82—1.3 20 Claims



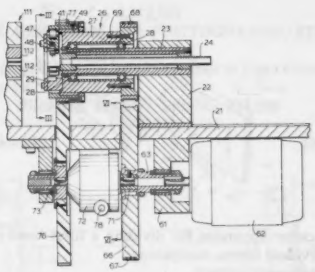
1. An oval-cutting assembly including in combination:
a flat elongated frame member having a pair of parallel transverse members and a longitudinal through slot in between them,
a circular disc in between and tangent to said transverse members and having a radially extending through slot lying mainly to one side of the disc's center and a handle rigidly secured eccentrically to said disc on the other side of the disc's center,
a rotatable disc-shaped upper bearing rotatably and slidably mounted in said longitudinal slot and having a flat face with a non-circular extension therefrom that fits non-rotatably but slidably in said radially-extending slot, said circular disc resting on said flat face,
a rotatable lower bearing member keyed to said upper bearing for rotation therewith and bearing rotatably on the bottom of said frame member,
clamp means for clamping said extension to said disc at a selected position in said radially-extending slot to provide a chosen amount of eccentricity,
cutter holder means,
attachment means securing said cutter holder means to said lower bearing member for rotating said cutter holder means and moving it longitudinally with said upper bearing,
a cutter assembly including a cutter blade, spring means for yieldably urging said blade against any object to be cut, and a cutter holder bar,
means for rigidly securing said cutter holder bar to said cutter holder means, and
means for setting said cutter holder bar at a chosen position relative to said cutter holder means to determine the minor diameter of said oval.

4,112,794
TUBE CUTTER WITH PHASE CHANGER

Lawrence A. Franks; Steven L. Stroup, and James E. Perry, all of Sturgis, Mich., assignors to Burr Oak Tool & Gauge Company, Sturgis, Mich.

Filed Sep. 6, 1977, Ser. No. 830,389
Int. Cl.[2] B23B *3/04*, *5/14*
U.S. Cl. 82—64 11 Claims

1. In an apparatus for cutting a tubular element, said apparatus having a frame, means associated with said frame for holding an elongated tubular element, and a rotatable cutting head assembly positioned in surrounding relationship to said tubular element and rotatable about an axis substantially aligned with the axis of said tubular element, said cutting head assembly including rotatable support means having a rotatable cutting element mounted thereon for rotation therewith, and mounting means coacting between said cutting element and said support means for permitting said cutting element to move radially inwardly into rolling engagement with the tubular element to effect cutting thereof as the cutting element rolls therearound due to rotation of said support means, the improvement comprising ringlike cam means concentrically rotatably supported on said support means, said cam means having a cam surface cooperating with said mounting means for causing the cutting element to be urged radially inwardly toward the tubular element so as to rollingly cuttingly engage same, and drive means for causing high speed rotation of said support means

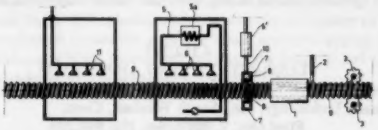


and said cam means, said drive means including first and second power transmission means respectively drivingly connected to said support means and said cam means for normally causing rotation thereof at the same rotational speed, said drive means also including phase change means coacting with at least one of said power transmission means for selectively causing a small rotational speed differential between said support means and said cam means, said speed differential causing said cam means to relatively rotate with respect to said mounting means for camming said cutting element radially inwardly for engagement with the tubular element.

4,112,795
PROCESS FOR PERFORATING PLASTICS TUBES

Warner Jan de Putter, Hardenberg, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Continuation of Ser. No. 664,939, Mar. 8, 1976, abandoned. This application Dec. 9, 1977, Ser. No. 859,159
Int. Cl.[2] B23B *39/20*
U.S. Cl. 83—15 5 Claims



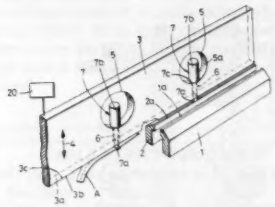
1. In a process for perforating a thin-walled corrugated tube composed of a polyolefinic material by means of a punching or cutting operation, the improvement wherein prior to the punching or cutting operation the tube is sequentially
(1) contacted with a liquid spray which is at a temperature of between about 0° to 5° C., and
(2) contacted with a stream of air at a temperature less than the temperature of the water spray of step (1).

4,112,796

CUTTER APPARATUS FOR DIVIDING A FORM BAND OR THE LIKE INTO INDIVIDUAL FORMS

Heinz Brechbühl, Oberdiessbach, Switzerland, assignor to Maschinenfabrik Kern AG Konolfingen, Konolfingen, Switzerland

Filed Sep. 1, 1977, Ser. No. 829,869
Claims priority, application Switzerland, Sep. 7, 1976, 011331/76
Int. Cl.² B26D 7/18
U.S. Cl. 83—141 2 Claims



1. A cutter apparatus for dividing a form band or the like into individual forms, comprising:

two stationary cutters:

a movable cutter beam coacting with said two stationary cutters;

said movable cutter beam having a lower narrow side equipped at both marginal regions thereof with two cutter edges which cut out of the form band a transverse strip during each cutting stroke of said cutter beam;

at least one ejector element comprising an ejector bolt freely movably mounted at the cutter beam between two terminal positions and disposed essentially perpendicular to said narrow side of said cutter beam;

said ejector element being movably between an inner terminal position in which said ejector element is located completely within the cutter beam and an outer terminal position in which an end region of the ejector element neighboring the narrow side of the cutter beam protrudes therefrom, in such a manner that during a rapid return stroke of the cutter beam away from said two stationary cutters the ejector element subjected to the action of inertia detaches a transverse strip from the cutter beam which has just been cut out of the form band;

said cutter beam possesses a number of transverse holes distributed over its length;

each said ejector bolt being arranged to cooperate with a related one of said holes;

said cutter beam possessing a respective bore merging with each said hole;

each ejector bolt having a thicker upper portion freely movable within a related one of the holes and a lower portion guided in a bore of the related hole of the cutter beam; and

each said lower portion including the end region of the ejector element acting upon the cutoff transverse strip.

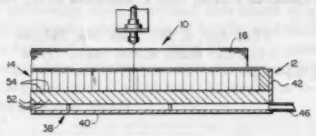
4,112,797

FLUID JET CUTTING APPARATUS

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Oct. 7, 1977, Ser. No. 840,273
Int. Cl.² B26F 3/00; D06H 7/00
U.S. Cl. 83—177 23 Claims

1. Fluid jet cutting apparatus comprising a bed assembly including a plurality of spaced apart members having sharp upper portions disposed in a common generally horizontal plane and defining a fluid permeable sheet material supporting surface, a fluid jet cutting tool mounted above said supporting surface and including a jet nozzle directed toward said fluid permeable supporting surface for discharging a high velocity stream of cutting fluid to impinge upon material supported on said fluid permeable supporting surface, and controlled positioning means for moving said fluid jet cutting tool relative to



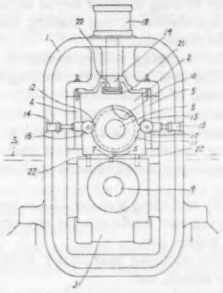
said fluid permeable supporting surface with said jet nozzle directed toward said fluid permeable supporting surface.

4,112,798

DRUM TYPE FLYING SHEAR

Isamu Yoshizawa; Hiroyuki Okubo, both of Yokohama; Hiroshi Isozaki, Zushi; Tsutomu Hara, and Bunpei Masuda, both of Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Apr. 26, 1977, Ser. No. 791,050
Claims priority, application Japan, Apr. 28, 1976, 51/49588
Int. Cl.² B23D 25/12
U.S. Cl. 83—344 2 Claims



1. A drum type flying shear comprising a housing, an upper bearing box supporting an upper drum having an upper blade and a lower bearing box supporting a lower drum having a lower blade, said bearing boxes are mounted said housing, guide means in said housing, at least one of said bearing boxes being fitted between guide means in such a way that, it is slidable downwardly and upwardly at an angle to the vertical, driving cylinder means is provided for said guided bearing box for said slidable movement thereof, cam means are attached to the shaft of the drum carried by said guided bearing box, an hydraulic cylinder means having a piston rod cam follower means in the form of a roller is attached to the free end of said piston rod and is in engagement with the periphery of each of said cam means, said driving hydraulic cylinder means and said hydraulic cylinder means are hydraulically intercommunicated with each other to establish a closed-loop hydraulic circuit, and balancing means is provided for pressing against the movement of said guided bearing box by the driving hydraulic cylinder.

4,112,799
CUTTING APPARATUS

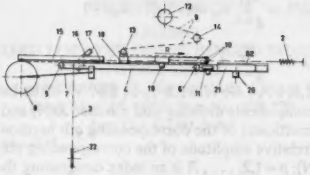
Bernardus Daenen, Uitgeest, Netherlands, assignor to Van der Molen Machinefabriek B.V., Zaandam, Netherlands

Filed Jan. 31, 1977, Ser. No. 764,173

Claims priority, application Netherlands, Feb. 13, 1976, 7601478

Int. Cl.² A24B 7/00

U.S. Cl. 83—409 **5 Claims**



1. An apparatus for cutting wrapper for cigars from a ribbon, comprising a frame, a guide for a conveyor mounted on said frame, a conveyor movable on said guide, an endless conveyor belt positioned beneath said conveyor parallel to said guide and passing over rollers mounted on said frame, a support means for a roll of tobacco ribbon mounted on said frame, a suction head spaced above said conveyor belt and located directly behind the support means but in front of said conveyor, means for moving the conveyor over the guide, clamp for the conveyor with which the combination tobacco ribbon-carrier and belt can be urged to the conveyor, pneumatic means connected to the conveyor moving means to govern the control functions of the apparatus and clamp, a blade and a forming block corresponding to the contour of the wrapper positioned at one end of said conveyor belt.

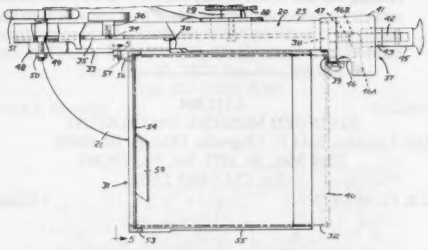
4,112,800
APPARATUS FOR SUCCESSIVELY DISPENSING FROM A CAN OF A JELLIED PRODUCT SLICES OF A CROSS SECTIONAL AREA LESS THAN THAT OF THE CAN

Lawrence S. Cole; Ruth J. Cole, both of High Street, North Carver, Mass. 02355, and Rigo Facchini, North Plymouth, Mass. 02360

Continuation of Ser. No. 672,870, Apr. 2, 1976, abandoned. This application Jun. 30, 1977, Ser. No. 811,476

Int. Cl.² B26D 4/80, 7/04

U.S. Cl. 83—411 A **19 Claims**



1. Apparatus for successively dispensing slices of a jellied product from a can that is open at one end, the slices of a cross sectional area less than that of the can, said apparatus comprising a dispenser including a can holder disposed and dimensioned to hold said can open end downwardly thus ensuring movement of the product toward its open end by gravity and so that it may be rotated, an insert in said can frictionally held thereby so that the can and the insert turn together and become parts of a unit, said insert including walls spaced and arranged to divide its contents into a plurality of lengthwise sections, a fixed retaining plate associated with said holder engageable by the product as a stop to prevent such movement, said walls terminating above said plate, said plate having a slot extending outwardly from the center thereof and including a forwardly and upwardly inclined blade at the rear of said slot with the cutting edge of the blade close to the lower ends of the walls of the insert and operable as the can is rotated to sever the sections successively and to force them through said slot, and means attached to a part of said unit and operable to effect the rotation thereof in the appropriate direction relative to the blade.

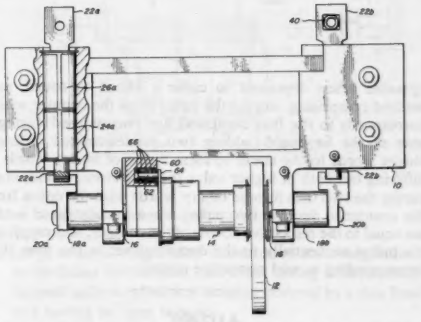
4,112,801
KNIFE ASSEMBLY FOR PHOTOGRAPHIC STRIP CUTTER

Robert E. Diesch, Rogers, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Sep. 29, 1977, Ser. No. 837,998

Int. Cl.² B26D 5/08

U.S. Cl. 83—586 **18 Claims**



1. A knife assembly for cutting photographic strip material, the knife assembly comprising:

a base;

stationary blade means mounted to the base;

a source of rotary power;

a crankshaft for rotation about a crankshaft axis;

clutch means for selectively imparting the rotary power from the source of rotary power to the crankshaft;

first and second linear drive shafts connected to the crankshaft and extending through the base along first and second drive shaft axes which are substantially parallel to one another and normal to the crankshaft axis;

first and second linear bearing means mounted in the base along the first and second drive shaft axes, the first and second linear drive shafts and the first and second linear bearing means, respectively, forming an interference fit; and

movable blade means connected between the first and second linear drive shafts, whereby a single revolution of the crankshaft causes the movable blade means to engage the stationary blade means and cut the strip material and then withdraw to a non-engaging rest position.

4,112,802
ORGAN CIRCUITRY FOR PROVIDING FILL NOTES AND METHOD OF OPERATING THE ORGAN

John William Robinson, Jasper, Ind.; Thomas C. Crosby, Monroeville, Pa., and Stephen Louis Howell, Ireland, Ind., assignors to Kimball International, Inc., Jasper, Ind.

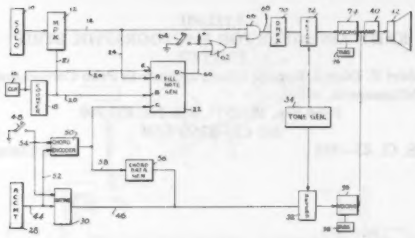
Filed Dec. 20, 1976, Ser. No. 752,830

Int. Cl.² G10H 1/00, 5/00

U.S. Cl. 84—1.01 **30 Claims**

1. The method of operating an electronic organ having tone

generator means and transducer means and keyers interposed therebetween, keyboard means having playing keys and comprising a solo portion and an accompaniment portion, a multiplexer for scanning at least said solo portion of said keyboard and including a clock driven binary counter, said multiplexer generating a data stream on each scan of the keyboard containing key down signals in respective time slots for each depressed playing key, and a demultiplexer synchronized with and connected to said multiplexer and responsive to key down data supplied thereto by said multiplexer for actuating said keyers, said playing keys including chord playing keys each



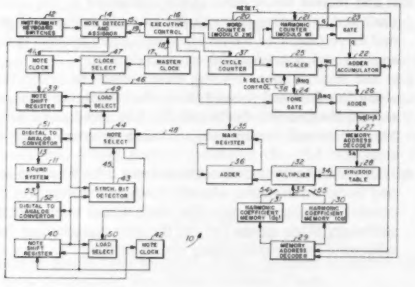
operable when depressed to cause a chord to sound, said method comprising: storing the count from the counter which corresponds to the first depressed key encountered during a scan of the keyboard, adding two predetermined different binary words to the count to form a pair of binary words of differing but both of higher value than the stored count, comparing the two thus formed binary words with the count from the counter to develop two pulses when the compared words are equal to the respective counts of the counter, and supplying the pulses sequentially to the demultiplexer in the time slots corresponding to said respective counts.

4,112,803

ENSEMBLE AND ANHARMONIC GENERATION IN A POLYPHONIC TONE SYNTHESIZER

Ralph Deutsch, Sherman Oaks, Calif., assignor to Deutsch Research Laboratories, Ltd., Los Angeles, Calif.

Filed Dec. 29, 1975, Ser. No. 644,450
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.24 **22 Claims**



1. A musical instrument exhibiting an ensemble effect comprising;

a first memory means for writing master data set to be thereafter read out, wherein number N designates the address of words in said first memory means,

means to set contents of first memory means to zero values at start of a computation cycle,

first means for computing number Y(N) in master data set during each computation cycle of a sequence of computation cycles for providing an emsemble effect, wherein said master data set is composed of a multiplicity R+1 of submaster data sets each containing numbers Z(N), $X_1(N)$, $X_2(N)$, . . . , $X_R(N)$ and such computing is in accordance with the relations

$$Y(N) = Z(N) + X_1(N) + X_2(N) + \ldots + X_R(N)$$

$$Z(N) = \sum_{q=1}^{W} c_q \sin(\pi Nq/W)$$

$$X_1(N) = \sum_{g=1}^{M_1} d_{1q} \sin[\pi Nq(1+jk_1)/W]$$

$$X_p(N) = \sum_{g=1}^{M_p} d_{pq} \sin[\pi Nq(1+jk_p)/W]$$

where $q=1,2,\ldots,W$; $N=1,2,\ldots,2W$; W is the number of harmonic components defining said number Z(N) and c_q is the harmonic coefficient of the corresponding qth harmonic establishing the relative amplitude of the corresponding qth component of Z(N); $p=1,2,\ldots,R$ is an index designating the out-of-tune submaster data sets; M_p is an integer not greater than W which specifies the number of harmonic components defining said numbers $X_p(N)$ and d_{pq} is the harmonic coefficient of the corresponding qth harmonic establishing the relative amplitude of the corresponding qth components; the numbers k_p are phase constants selected from a set of phase constants; j is a number incremented repetitively; said first means comprising

a memory storing said harmonic coefficient sets c_q and d_{pq},

a sinusoid table comprising a memory storing values of $\sin(\pi\phi/W)$ for $0 \leqq \phi \leqq 2W$ at intervals of D where D is a resolution constant,

harmonic component evaluation circuitry utilizing said memory and said sinusoid table to calculate $c_q \sin(\pi Nq/W)$ for each of the W harmonic components of said number Z(N) in accordance with a selected value of N and to calculate $d_{pq} \sin[\pi Nq(1+jkp)/W]$ for each of the M_p harmonic components of said numbers $X_p(N)$ in accordance with a selected value of N,

means for successively algebraically summing output of said harmonic evaluation circuitry with contents of word N in said first memory means,

second memory means for storing a master data set to be thereafter read out,

second means responsive to first means for transferring said master data set from first memory means to said second memory means,

means for converting a master data set to a musical waveshape, and

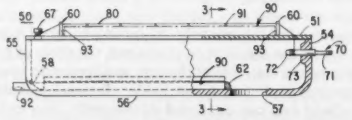
third means responsive to said second means for repetitively reading out the words of said master data set from second memory means and providing said read out words to said means for converting, the musical waveshape so produced exhibiting an ensemble effect.

4,112,804

STRINGED MUSICAL INSTRUMENT

Jack Cecchini, 5344 N. Magnolia, Chicago, Ill. 60640

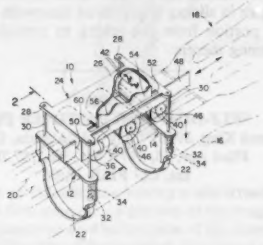
Filed Mar. 18, 1977, Ser. No. 778,941
Int. Cl.[2] G10D *1/00*
U.S. Cl. 84—173 **9 Claims**



1. A stringed device, comprising a sound chamber having a first aperture therein, a plurality of longitudinally extending and transversely spaced-apart strings extending over said first aperture, stop means for fixedly securing one end of said

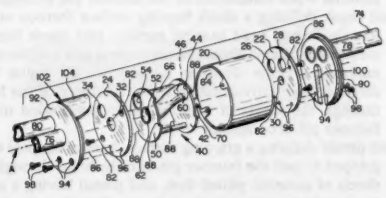
strings near one end of said sound chamber, tensioning means connected to the other end of said strings near the other end of said sound chamber for adjusting the tension in said strings across said aperture, a second aperture in said sound chamber in the rear thereof sized to facilitate operation of said tensioning means and to provide a grip for holding the device, and bridge means intermediate said stop means and said tensioning means for maintaining said strings a sufficient distance away from said sound chamber to accommodate a finger board between said sound chamber and said strings.

4,112,805
CHORD LOCATER FOR STRINGED MUSICAL INSTRUMENTS
Ian T. Carter, 3624 156th St., Surrey, B.C., Canada (V3S/4N7)
Filed May 25, 1977, Ser. No. 800,279
Int. Cl.² G10D *3/04*
U.S. Cl. 84—317 **6 Claims**



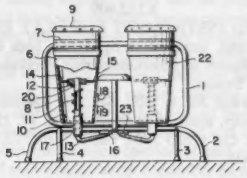
1. A chord locator for a stringed musical instrument comprising:
clamp means adapted to be mounted on the stringed musical instrument,
a housing reciprocably mounted on said clamp means,
a plurality of drums rotatably mounted in said housing above the strings of the musical instrument,
means on said housing for selectively rotating said drums in unison, and
a plurality of stops fixed in predetermined spaced relation to the circumference of each of said drums above the strings of said musical instrument,
whereby upon movement of said housing towards the strings of said musical instrument said stops will stop said string in proper position to produce a predetermined chordal note.

4,112,806
AXIAL FLOW VALVE
Orla E. Thayer, P.O. Box 473, Waldport, Oreg. 97394
Filed Jan. 31, 1977, Ser. No. 764,028
Int. Cl.² G10D *9/04*
U.S. Cl. 84—390 **2 Claims**



1. A musical wind instrument comprising:
a lead pipe having a mouthpiece at one end thereof;
a main bore terminating in an instrument bell;
a slide loop;
a casing having two opposite ends, said main bore and one end of said loop being connected to one of said opposite ends, said lead pipe and the other end of said loop being connected to the other of said opposite ends;
a rotor rotatable in said casing having a primary rotor passage which directly connects said lead pipe to said main bore when said rotor is in a first position and which connects said lead pipe to said one end of said loop when said rotor is rotated to a second position, said rotor also having a secondary rotor passage which connects said other end of said loop to said main bore when said rotor is in said second position.

4,112,807
CONGA DRUM SET
Peter R. Quibell, Ocean Springs, Miss., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Feb. 25, 1977, Ser. No. 771,936
Int. Cl.² G10D *13/02*
U.S. Cl. 84—411 R **4 Claims**

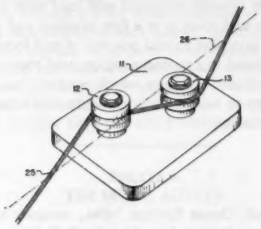


1. A conga drum set, comprising
a frame;
a conga drum having a band therearound and being affixed to the frame via the band, said drum having a substantially tapered hollow cylindrical housing covered by a skin head and having an open bottom;
a piston rod type member extending into the housing of the drum through the open bottom thereof substantially coaxially therewith and having spaced opposite first and second ends, the first end being in the housing and the second end being spaced below the housing and outside said housing;
a piston type member affixed to the first end of the piston rod type member;
a pedal extending from the second end of the piston rod type member outside the housing; and
moving means mounting the piston rod type member for movement in axial directions whereby said piston rod type member is axially movable via the pedal and moves the piston type member accordingly to vary the pitch of the drum.

4,112,808
DEVICE FOR CLEANING AND REVITALIZING WOUND STRINGS FOR MUSICAL INSTRUMENTS
Richard J. Ketterer, 35 Glenbrook Dr., Pittsburgh, Pa. 15235
Filed Jun. 9, 1977, Ser. No. 805,184
Int. Cl.² G10G *7/00*; G10C *9/00*
U.S. Cl. 84—453 **4 Claims**

1. A device for cleaning and revitalizing the wound strings of musical instruments comprising a polygonal base plate of light-weight material, and capable of being conveniently held in one hand, two similar cylindrical rollers mounted for rotation on respective axes perpendicular to the plane of said base plate, said rollers being of hardened metal and having respective aligned annular grooves therein normal to the axes of rotation, the bottom of said grooves being substantially semicircular in contour, the axes of said rollers being spaced laterally and longitudinally in a ratio of approximately 1 to 3 to

insure distension of the wound turns in the musical strings as the device is shifted longitudinally along a musical string engaging an arc on the side of one roller and an arc on the diametrically opposite side of the other roller.



4,112,809

STRINGED INSTRUMENT FOR PLAY TRAINING

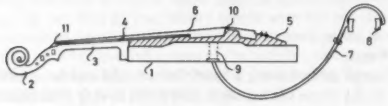
Gunnar Sjöstrand, and Staffan Sjöstrand, both of Åtvidaberg, Sweden, assignors to Musikindustriell Forskning MIFO AB, Atvidaberg, Sweden

Filed Jul. 9, 1976, Ser. No. 704,086

Claims priority, application Sweden, Jul. 17, 1975, 7508174

Int. Cl.[2] G10D *3/04*; G09B *15/06, 15/00*

U.S. Cl. 84—465 **3 Claims**



1. Training instrument for practicing the playing of a stringed instrument comprising the neck and grip-board of a stringed instrument for a set of strings to be attached at one of their ends to said neck, a plate attached to said grip-board to support the other ends of said strings, a structure to simulate a resonance-box comprising a body of sound-damping material to minimize the exterior dispersion of sounds produced by the strings, and acoustic sound pickup means attached to said plate within said structure to transmit sounds from the strings to the user of the instrument.

4,112,810

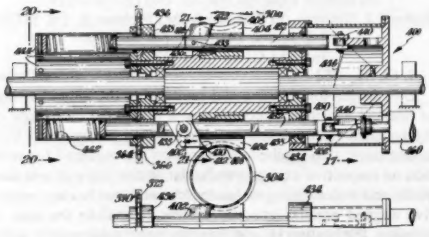
TUBE SLOTTER

Logan L. Dreibelbis, Cincinnati, Ohio, assignor to Advanced Drainage Systems, Inc., Columbus, Ohio

Filed Oct. 20, 1976, Ser. No. 734,197

Int. Cl.[2] B26D *3/16*

U.S. Cl. 83—490 **22 Claims**



1. A tube slotting machine for cutting a series of transverse slotted openings in flexible corrugated tubing comprising a main framework, tube supporting and conveying means connected to the framework for guiding the tubing through the machine, and cutting means adapted to engage the tubing as it travels through the machine and to cut transverse slotted openings therein, the cutting means including a plurality of primary cutter blades, an equal number of spaced apart secondary blade pairs, the secondary blades of each secondary blade pair being slightly spaced apart with a primary blade located therebetween, each primary blade being mounted for sliding engagement with the secondary blades of its associated secondary blade pair, each of the secondary blades having a curved portion that complements the curvature of the tubing, means for positioning the curved secondary blade pairs next to the exterior of the tubing as it moves through the machine along its path of travel, and means for shifting the primary cutter blade across its associated secondary blade pair when that blade pair is next to the exterior of the tubing whereby the primary blade penetrates the tubing and sweeps across its associated secondary blade pair in sliding engagement therewith to thereby cut a slivered portion from the tubing to provide a transverse slotted opening therein.

4,112,811

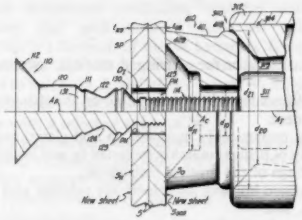
SELF-DIMPLING FASTENER PIN

John Olmsted King, 3990 N. Ivy Rd., Atlanta, Ga. 30342

Filed Apr. 15, 1977, Ser. No. 787,758

Int. Cl.[2] F16B *19/08*

U.S. Cl. 85—7 **6 Claims**



1. A self-dimpling fastener pin with a common pin central axis for use in forming dimpled fastener joints connecting thin sheets of material having aligned fastener holes of an initial hole diameter therethrough comprising:

a shank; a head integral with one end of said shank; and, a pintail integral with the opposite end of said shank with said shank, head and pintail coaxial with each other and concentric about the pin central axis,

said head defining a tapered head bearing surface on the underside thereof facing said shank concentric about the pin central axis and having a size and shape corresponding to the desired size and shape of the dimple in the sheets of material when installation of the fastener pin is complete,

said shank defining a shank bearing surface thereon which joins with said head bearing surface, said shank bearing surface concentric about the pin central axis and having a minimum outside diameter larger than the initial hole diameter and corresponding to the diameter of the holes through the sheets of material when installation of the fastener pin is complete,

said pintail defining a gripping surface thereon adapted to be gripped to pull the fastener pin into the holes through the sheets of material, pintail first, said pintail having a maximum outside gripping diameter smaller than the initial hole diameter so that said gripping surface on said pintail will slidably pass through the holes in the sheets of material prior to the formation of the dimple therein, and,

said fastener pin further defining at least one tapered dimple bending surface thereon facing and trailing said gripping surface on said pintail and leading said shank bearing

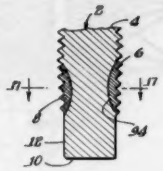
surface having a size and shape such that said dimple bending surface will bend the sheets of material to form the dimple therein as the fastener pin is pulled into the holes, pintail first, until said head bearing surface is in bearing contact with the sheets of material in the thusly bent dimple.

4,112,812

HEAT-TREATED ARTICLE

Charles H. Wardwell, and Norman L. Holcomb, both of South Dartmouth, Mass., assignors to Research Engineering & Manufacturing, Inc., New Bedford, Mass.

Division of Ser. No. 128,040, Mar. 25, 1971, Pat. No. 3,769,103.
This application Feb. 22, 1973, Ser. No. 334,705
Int. Cl.[2] F16B *25/00, 33/06*
U.S. Cl. 85—46 **7 Claims**



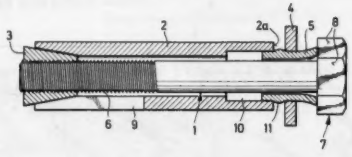
1. An article of manufacture having a shank with a work-entering end, a first zone over a portion of the length thereof, and a second zone over another portion of the length thereof, said zones being peripherally threaded, the thread at said first zone including means for producing a thread in a workpiece and the thread at said second zone constituting a means for engaging the thread that is produced in the workpiece, said first zone being intermediate said work-entering end and said second zone, the first zone being locally heat-treated at its peripheral region to a depth that includes at least a portion of the thread depth thereat but leaves a core of the shank at both zones and the thread on said second zone of a lesser hardness, the locally heat-treated part of said first zone being of substantially the same composition as the core surrounded thereby.

4,112,813

EXPANSION ANCHOR ASSEMBLY INCLUDING A YIELDING MEMBER

Wolf Kuhlmann, Munich, and Gerhard Rumpp, Inning, both of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Aug. 13, 1976, Ser. No. 714,333
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1975, 2536137
Int. Cl.[2] F16B *13/06, 31/02*
U.S. Cl. 85—74 **7 Claims**



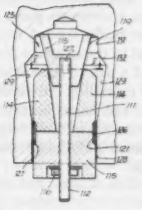
1. An expansion anchor or straddling dowel insertable into a borehole in a support structure for securing a member to the support structure, said anchor comprising an axially elongated bolt having a first end and a second end, the first end of said bolt arranged to be inserted first into the borehole in the support structure, means on the second end of said bolt forming a laterally outwardly projecting shoulder facing toward the first end of said bolt for use in securing the member to the support structure, an expansion sleeve laterally enclosing at least a portion of the axial length of said bolt and having a first end closer to the first end of said bolt and a second end spaced between and from the first end of said expansion sleeve and said shoulder means, a spreader positioned on the first end of said bolt and arranged to expand the first end of said expansion sleeve when said bolt is displaced axially, stop means positioned on said bolt and extending laterally outwardly from said bolt and located adjacent the second end thereof for limiting the depth of insertion of said bolt into the borehole in the support structure, wherein the improvement comprises means located between the second end of said expansion sleeve and said shoulder means for yielding under the application of the forces applied for expanding said expansion sleeve by said spreader so that the axial distance between said shoulder means and the second end of said expansion sleeve is reduced and for yieldably spacing said stop means from said shoulder means before the administration of the axially applied forces which expand said expansion sleeve said means for yielding under the application of axially applied forces and for yieldably spacing said stop means from said shoulder means comprises an unitary axially elongated tubular shaped member having a first end and a second end spaced apart in the axial direction with the second end thereof in contact with said shoulder means, said stop means comprising an annular washer laterally enclosing said tubular shaped member at a position spaced from the first and second ends thereof, at least a portion of said tubular shaped member between the location thereon of said washer and the second end of said tubular shaped member having an outside diameter which is greater than the smallest inside diameter of said washer and said tubular shaped member being deformable so that the outside surface thereof can be displaced through the opening through said washer.

4,112,814

DOWELS AND PROCESS FOR ANCHORING DOWELS

Heinrich Bernhard Schafers, Wachmannstrasse 22, Bremen, Germany (2800)

Filed Mar. 24, 1977, Ser. No. 780,844
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2613499
Int. Cl.[2] F16B *13/06*
U.S. Cl. 85—75 **11 Claims**



1. A dowel for anchoring in a borehole having a frustum-shaped enlargement defining a conical surface, said dowel having expanded and unexpanded positions and comprising a central bolt having an inner end and a spreader head on said inner end, a segmented ring of shells arranged about said bolt axially adjacent the spreader head in the unexpanded position of the dowel, means flexibly connected to said ring of shells for holding said ring of shells about said bolt, means for moving said ring of shells and spreader head axially relative to each other to urge the ring of shells radially outwardly toward the expanded position of the dowel, stop means for limiting the axial relative movement between the ring of shells and spreader head to determine the expanded position of the dowel, said shells having outer surfaces which define, in the

expanded position of the dowel as determined by said stop means, a truncated conical surface which corresponds with the shape of said frustum-shaped enlargement, whereby substantially the entire outer surfaces of said shells engage the conical surface of said frustum-shaped enlargement.

4,112,815

PLASTIC FIXING DEVICE

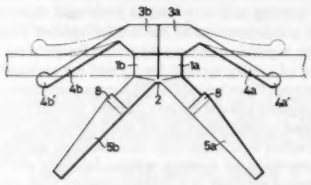
Toshie Tanaka, Machida, Japan, assignor to Nifco Inc., Tokyo, Japan

Filed Apr. 14, 1977, Ser. No. 787,664

Claims priority, application Japan, Apr. 15, 1976, 51/46034[U]

Int. Cl.[2] F16B *19/00*

U.S. Cl. 85—80 **4 Claims**



1. A one-piece plastic fastener adapted to be accepted in an apertured workpiece including a shank which is axially split into two substantially D-shaped opposed shank sections which when in abutting relationship form a solid cylinder, said shank sections connected to each other at respective first ends by a hinge means so that said shank sections can be freely moved toward abutting relationship and away from each other about said hinge means, head means extending laterally at the opposite ends of each of said shank sections, said head means having surfaces abutting when said shank sections abut and having undersurfaces with a greater lateral extent than said aperture for engaging said workpiece, said head means each being relieved along an edge opposite said abutting surface and further including a pair of resilient wing members integral with said head means along said edge in spaced relation to said shank, said wings extending outwardly away from said head means and angularly downwardly toward said first ends of said shank sections, said wing members terminating in free ends lying substantially on a common plane perpendicular to said axial split, said plane being spaced from said head means a distance at least equal to the distance from said head means to said hinge means, and a pair of substantially D-shaped integral leg members initially extending outwardly and angularly away from the first ends of said shank sections generally parallel to said wing member attached to their respective shank sections, each of said leg members includes shoulder means spaced from and facing said shank.

4,112,816

METHOD OF MAKING A CORD HAMMOCK

Meryl L. Muskus, Chicago, Ill., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Aug. 1, 1977, Ser. No. 820,438

Int. Cl.[2] A45F *3/22*; A47C *17/84*; D04G *1/00*

U.S. Cl. 87—12 **1 Claim**

1. A method of making a cord hammock, comprising the steps of

cutting a length of cord into 23 strands 28 feet long;

cutting two of the strands into 12 4-foot 8-inch long strands;

knotting the 12 strands at two points 9 inches from each end to provide a mounting cord;

braiding the 12 strands from each knot and tying an overhand knot to end each braid, leaving a few inches of tassle thereby completing the mounting cord;

extending the mounting cord taut;

tying each of the 21 strands on the mounting cord by Lark Head knots thereby having 21 knots making 42 single strands;

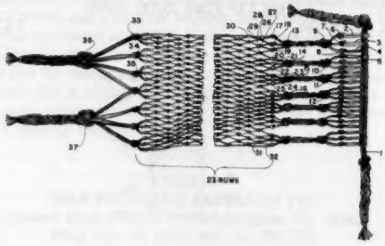
tying a first overhand knot in each double strand 5 inches down from the Lark Head Knot;

tying one large second overhand knot 2 inches down from the first overhand knots with each three first overhand knots, forming a row of seven large knots;

braiding each six strand bundle about 4 inches;

tying seven additional overhand knots to end the braids;

separating the six strands into twos and tying three overhand knots 1 inch down from each of the seven knots, forming



a row of 21 knots and a row of 42 loose strands, and skipping the first strand, tying an overhand knot 2 inches down in the second and third strands, the fourth and fifth strands, the sixth and seventh strands, and so on, leaving the 42nd strand;

tying the first strand to the second strand, and third and the fourth strands, the fifth and the sixth strands, and so on, ending in tying the 41st and 42nd strands;

repeating the two preceding steps until 23 rows are formed;

tying an overhand knot 3 inches down with each three double strands to form a last row of seven large knots;

dividing the 42 strands into two sections and tying two large overhand knots 5 inches down from the last row; and

braiding both strands about 6 inches down.

4,112,817

SUPPLY DEVICE FOR A PORTABLE FIREARM BY MEANS OF CARTRIDGE BELTS OR BY MEANS OF RIFLE MAGAZINES USING THE SAME AMMUNITION

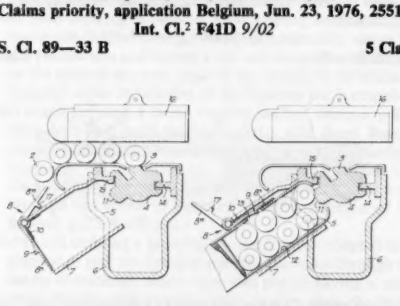
Maurice V. Bourlet, Liege, Belgium, assignor to Fabrique Nationale Herstal S.A. en abrege FN, Herstal, Belgium

Filed Apr. 18, 1977, Ser. No. 788,342

Claims priority, application Belgium, Jun. 23, 1976, 255131

Int. Cl.[2] F41D *9/02*

U.S. Cl. 89—33 B **5 Claims**



1. Device for supplying portable arms by means of cartridge belts or by means of rifle magazines using the same ammunition, characterized by the fact that the weapon is provided with a lateral opening extended by a sleeve which serves as guide for a magazine, aforesaid sleeve being fitted with a flap

which is conditioned in such a manner as to be able to close aforesaid sleeve and to serve as guide for the cartridge belt, the bolt having at least two tenons, one of which is used to act, one by one, upon the cartridges of a belt, and the other being used to act, one by one, upon the cartridges of a magazine.

4,112,818

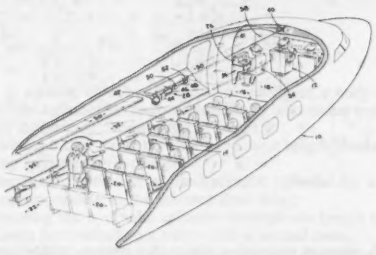
SURVEILLANCE AND WEAPON SYSTEM

Jacob W. Garehime, Jr., 1700 Griffith Ave., Las Vegas, Nev. 89104

Continuation of Ser. No. 254,541, May 18, 1972, abandoned. This application Jul. 19, 1974, Ser. No. 490,053

Int. Cl.[2] **F41C** *9/00;* **F41H** *13/00*

U.S. Cl. 89—41 TV **22 Claims**



1. A remotely controlled surveillance and weapon system for the protection of a limited region, which comprises a weapon and optical scope means in fixed alignment so that the aim thereof is substantially coincident, means mounting said weapon and scope means for at least pan and tilt movability, one-way vision screen means interposed between said region and said weapon and scope means permitting vision in the direction from said scope means toward said region and precluding vision in the direction from said region toward said weapon and scope means, said screen means being arranged to substantially completely obscure said weapon and scope means from the view of persons in said limited region, electronic image sensor means optically coupled with said scope means to receive an optical image therefrom and substantially completely obscured from the view of persons in said limited region; a surveillance and control station disposed outside of said limited region, said station including a video surveillance screen operatively connected to said image sensor to exhibit a video image derived from said image sensor and reticle means in fixed position in said optical scope means whereby an image of said reticle is exhibited on said video image to indicate the point at which said weapon is aimed, a movement control unit operatively connected to said weapon and scope means and operable to produce at least pan and tilt movements of the weapon and scope means, and remote weapon firing means operatively connected to the weapon for firing the weapon through said screen means.

4,112,819

APPARATUS FOR PRODUCING CAMS

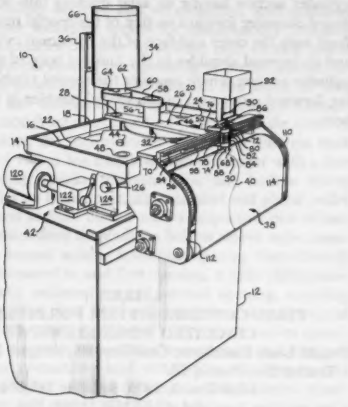
Richard A. Dooley, 400 S. Westwood Ave., Toledo, Ohio 43609

Filed Feb. 25, 1977, Ser. No. 772,076

Int. Cl.[2] **B23C** *1/18*

U.S. Cl. 90—13.9 **14 Claims**

1. Apparatus for shaping cams from cam blanks comprising a housing, a cutting tool, an arm rotatably carrying said cutting tool, said arm being pivotally connected to said housing on one side of said cutting tool and said arm being connected to a pointer on the other side of said cutting tool, first means and second means on said housing for holding and rotating a first cam blank and a second cam blank, respectively, said first and second holding and rotating means being located between the pointer and the pivotal connection to the housing and being laterally spaced apart to each side of said pivotal connection for supporting the first and second cam blanks in an overlap-



ping relationship, whereby said cutting tool can engage and shape both of said cam blanks simultaneously.

4,112,820

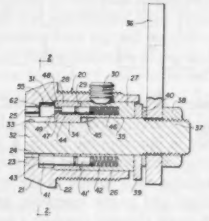
TAMPER-PROOF AXIAL TUMBLER TYPE LOCK

William H. Conger, and Ronald F. Gehringer, both of Sioux Falls, S. Dak., assignors to Nordica International, Inc., Sioux Falls, S. Dak., a part interest

Filed Nov. 23, 1977, Ser. No. 854,330

Int. Cl.[2] **E05B** *15/14, 19/02, 27/08*

U.S. Cl. 70—363 **4 Claims**



1. A tamper-proof lock comprising a relatively stationary casing, fixed and rotational cylinder sections within the casing having axially extending tumbler bores, a set of regular axially divided tumblers within said tumbler bores of said cylinder section and normally bridging a shear line face between said cylinder sections when the lock is active, a special axially divided tumbler within tumbler bores of said cylinder sections including a leading part which is flush with the outer end face of the rotational cylinder section, an axial post and laterally extending lock plate keyed to the rotational cylinder section to turn therewith, and a key for opening the lock including a tubular shank to engage over the post and into the casing and into abutment with the outer end face of the rotational cylinder section, the key having leading end peripheral recesses to engage and depress said regular tumblers to said shear line face and having a pin extension projecting forwardly of the leading end of said tubular shank and engaging said leading part of said special axially divided tumbler to depress the special tumbler to said shear line face when said key is fully inserted into the lock, whereby the key is then able to rotate the rotational cylinder section with said post and lock plate, and said special tumbler leading part including a reduced diameter forward

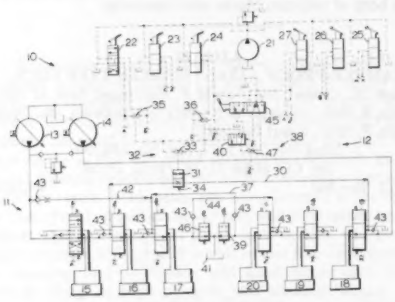
section axially aligned with and adapted to be abutted by the leading end of the pin extension of said key, said rotational cylinder section having an axial opening into which said reduced diameter forward section of the special tumbler extends flush with the outer end face of the rotational cylinder section and an internal shoulder in the tumbler bore of the rotational cylinder section which receives the special tumbler and limiting forward movement of the special tumbler in such tumbler bore.

4,112,821

FLUID CONTROL SYSTEM FOR MULTIPLE CIRCUITED WORK ELEMENTS

Donald Louis Bianchetta, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 3, 1976, Ser. No. 747,274
Int. Cl.² F15B *11/16*
U.S. Cl. 91—6 **7 Claims**



1. In a fluid system having at least first and second circuits each having a fluid source, a reservoir, a plurality of work elements connected in interruptible series, a work fluid pathway for each circuit, said work fluid pathways comprising a passageway connecting each source to the work elements of the respective circuit and to the reservoir, and a pilot pump connected to each work element through a respective control valve for controlling the operation of said work element, the improvement comprising:

a first bypass line separate from said work fluid pathways and being connected at one end to the first circuit at a location between work elements of said first circuit and at the other end to a preselected location on the second circuit;

a flow control valve positioned in the first bypass line, said flow control valve being movable between a first flow restricting position and a second open position;

first means for moving the flow control valve to the second position in response to operation of selected work elements of the first circuit and for moving the valve to the first position in response to termination of operation of selected work elements of the first circuit;

a second bypass line separate from said work fluid pathways and being connected at one end to the first circuit at a preselected location and at the other end to a preselected location on the second circuit; and

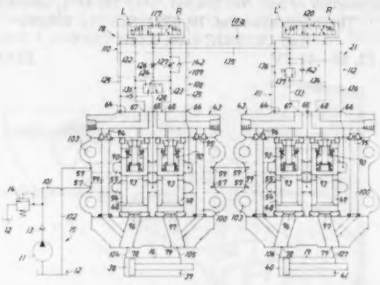
second means for controllably passing fluid from the second circuit into the second bypass line in response to operation of preselected work elements of the first circuit.

4,112,822

PRESSURE RESPONSIVE SEQUENCING DEVICE

Hikaru Murata, Gifu, Japan, assignor to Kayabakogyokabushikikaisha, Tokyo, Japan

Filed Jun. 6, 1975, Ser. No. 584,586
Int. Cl.² F15B *11/20, 13/07*
U.S. Cl. 91—29 **2 Claims**



1. A pressure responsive sequencing system, comprising

primary actuating circuit means having a primary double-acting fluid actuator and adapted to perform a first circuit operation;

secondary actuating circuit means having a secondary double-acting fluid actuator and adapted to perform a secondary circuit operation, each line of said actuating circuit means including an amplifier valve means having a main flow passage with a main orifice and a pilot pressure responsive supply and exhaust valve inserted therein and a pilot flow passage having a detector orifice inserted therein, the flow rate of the main flow in said main flow passage being amplified with respect to the flow rate in said pilot flow passage in a proportion corresponding to the ratios of the flow cross-section of said main and detector orifices whereby pilot and main flow join prior to entering a respective actuator;

a primary fluid supply line communicating with said pilot passage of said primary circuit means and having a meter-in flow control valve inserted therein;

a primary discharge line communicating with said pilot passage of said primary circuit means and with a reservoir and having a meter-out flow control valve inserted therein;

a secondary fluid supply line communicating said primary fluid supply line with said secondary circuit means; a secondary discharge line communicating with said secondary actuator;

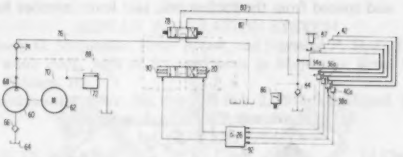
means for initiating said second circuit operation only upon the completion of said first circuit operation, comprising a pressure responsive sequencing valve in said secondary fluid supply line and operative to initiate said second circuit operation, and pressure responsive means for triggering the operation of said sequencing valve only upon completion of said first circuit operation and as a function of a pressure differential between the respective secondary supply and discharge lines;

two position pressure responsive switching valve means interposed between said primary supply and discharge lines and responsive to pressure differences in said primary lines by switching from a first position to a second position in which it communicates the respectively lower-pressure one of said primary lines with said reservoir.

4,112,823
METHODS AND APPARATUS FOR CONTROLLING AN HYDRAULIC CYLINDER

Harvey W. Liberman, Knoxville, and James Stephen Whitehead, Maryville, both of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,370
Int. Cl.² F15B *21/02*
U.S. Cl. 91—36 **5 Claims**



1. A method of controlling the extension of a multi-stage hydraulic cylinder through a plurality of successive uniform length increments comprising the steps of:

selecting a time delay between successive length increments by adjusting a first timer;

interrupting extension of the hydraulic cylinder for a time corresponding to the selected time delay;

extending the hydraulic cylinder through one length increment by controlling a valve with a second timer;

sequentially repeating the interrupting and extending steps until the cylinder is extended to a predetermined length exceeding the one length increment:

wherein the step of interrupting includes initiating the first timer in response to a start signal and generating a pulse at the end of the selected time delay;

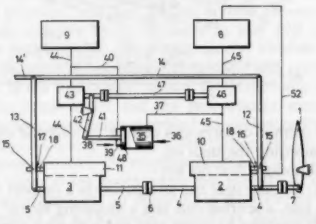
wherein the step of extending includes, starting the second timer and opening the valve in response to the pulse, and closing the valve and generating the start signal when the second timer reaches a time corresponding to one length increment; and

further including the step of switching the second timer to a different time as each successive stage of the hydraulic cylinder becomes active.

4,112,824
DOUBLE-HYDRAULIC ACTUATOR

Alois Krause, Neubiberg, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung, Munich, Germany

Continuation of Ser. No. 621,389, Oct. 10, 1975, abandoned.
This application Jun. 16, 1977, Ser. No. 807,184
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1974, 2450330
Int. Cl.² F15B *11/16*
U.S. Cl. 91—413 **3 Claims**



1. In a redundant fluid actuator system comprising at least two separate and separably operated servomotors, first and second fluid pressure sources, each of said servomotors having a first piston rod connected to each other and mounted for reciprocal movement and a control valve for controlling the movement of said first piston rods, each of said control valves having a second piston rod thereon, a common control member for controlling both of said servomotors, said common control member including means for mechanically coupling said common control member to at least each of said piston rods, means for preventing the operation of one of said servomotors while permitting an operation of the other of said servomotors, and change-over means for effecting a change-over in operation from one of said servomotors to the other of said servomotors, the improvement comprising wherein each of said control valves has a hollow sleeve member with a first axially extending opening therethrough, said hollow sleeve member having an intake port, a return port and plural outlet ports connected in fluid circuit with a respective one of said servomotors associated therewith, a hollow sleeve valve member having a second axially extending opening therethrough reciprocally mounted in said first opening, a slide valve member reciprocally mounted in said second opening, coupling means for coupling said slide valve member to said second piston rod of the respective one of said control valves associated with said respective one of said servomotors and connecting means for connecting said slide valve member to said hollow sleeve valve member for normal simultaneous movement together, said connecting means having a positive but a force limiting threshold connection characteristic to enable said slide valve member to move relative to said hollow sleeve member when said hollow sleeve valve member fails to move relative to said hollow sleeve member in response to a force applied by said common control member to said second piston rod which is greater than the threshold value of said connecting means;

wherein said change-over means consist of a differential cylinder having a reciprocal piston mounted therein and a rod connected to said piston and movable therewith, and a pair of shut-off valves each connected to fluid circuit between one of said first and second fluid pressure sources and one of said two servomotors for controlling the supply of pressurized fluid to said servomotors, a fluid circuit between said first and second fluid pressure sources and the corresponding one of said servomotors including a conduit, a first fluid connection to one end of said differential cylinder on one side of said piston and to said first fluid pressure source supplying pressurized fluid to one of said servomotors, a second fluid connection to the other end of said differential cylinder on the other side of said piston and connected directly to the one of said conduits extending between one of said shut-off valves and the other of said servomotors, each of said pair of shut-off valves having a control lever and means for connecting said control levers together and to said rod of said differential cylinder for simultaneous operation thereby;

wherein said differential cylinder has chambers of differing effective cross sectional area on opposite sides of said piston, a greater cross sectional area side corresponding to said other end of said differential cylinder and a lesser cross sectional area side corresponding to said one end of said differential cylinder, the pressure of said pressurized fluid from said first and second fluid pressure sources being equal wherein said piston will be urged to said one end of said differential cylinder having said lesser cross sectional area to effect an opening of the fluid pressure supply to said other servomotor while simultaneously shutting off the fluid pressure supply to said one servomotor;

wherein a shifting of the said slide valve member relative to said sleeve valve member effects a fluid connection between said intake port and said return port through an opening of such a cross section as to effect a fluid discharge from said intake port direct to said return port to cause a pressure drop in fluid pressure in said other end of said differential cylinder having the larger cross section and a shifting of said piston to cause a shutting off of said fluid pressure supply to said other servomotor while si-

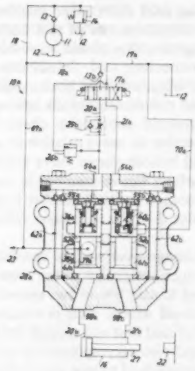
multaneously opening the fluid pressure supply to said one servomotor; and said first fluid pressure source being at all times in open fluid communication with said one end of the differential cylinder through said first fluid connection and said other end of the differential cylinder being at all times in open fluid communication with said one of said shut-off valves and the control valve for said other servomotor.

4,112,825

PRESSURE-REDUCING DEVICE

Hikaru Murata, Gifu, Japan, assignor to Kayabakogyokabushikikaisha, Tokyo, Japan

Filed May 21, 1975, Ser. No. 579,436
Int. Cl.[2] F15B *13/08*
U.S. Cl. 91—447 **8 Claims**



1. A hydraulic control circuit, comprising

a user having a primary side and a secondary side;

a source of hydraulic fluid;

fluid supply conduit means connecting said source with said primary side of said user;

a pump in said conduit means for supplying hydraulic fluid under pressure from said source to said primary side of said user at a first flow rate;

pressure compensating flow rate control valve means in said conduit means intermediate said pump and said user and operative for limiting the fluid flow to said primary side of said user to a second flow rate which is smaller than said first flow rate; and

relief valve means interposed in said conduit means between said control valve means and said user and communicating with said source, said relief valve means responding to pressure increase at said secondary side of said user by shunting the fluid flow from said pump back to said source so as to thereby control the maximum working pressure of said control valve means and reduce the pressure of said secondary side to the pressure limit given by the setting of said relief valve means.

4,112,826

VARIABLE DISPLACEMENT RECIPROCATING PISTON MACHINE

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1977, Ser. No. 792,668
Int. Cl.[2] F01B *31/14*; F02B *75/04*
U.S. Cl. 92—13.1 **5 Claims**

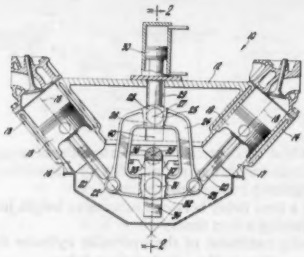
1. The combination in a reciprocating piston machine of a variable displacement mechanism whereby piston displacement may be varied at will while maintaining a predetermined range of compression ratios, said machine comprising

a frame defining at least one cylinder having an axis,

a piston disposed in the cylinder and reciprocable on the axis thereof,

a rocker member pivotable in a plane parallel to the cylinder axis about a rocker axis normal to said plane, said rocker member having a point laterally spaced from the rocker axis and connected with the piston by a connecting rod,

a lever member oscillatable about a lever axis parallel with and spaced from the rocker axis, said lever member having a lateral lever arm portion slidably engaging the rocker member at a point spaced from both said rocker and lever axes, and



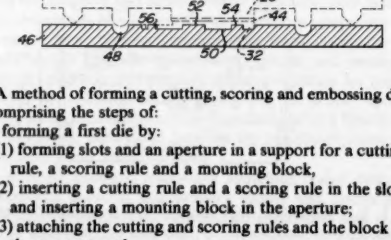
means for laterally shifting the rocker axis toward and away from the lever axis to vary the effective length of said lever arm portion at its engagement point with the rocker member, while at the same time moving the rocker member in a direction to vary the clearance of the piston in its cylinder in a ratio correlated with the variation in the effective lever arm length such that the piston displacement is varied while maintaining the piston compression ratio in a desired range.

4,112,827

METHOD OF MAKING CUTTING, SCORING AND EMBOSSING DIE SET

Pierson S. Kang, Lansdale, Pa., assignor to ChemPar Corporation, Montgomeryville, Pa.

Filed Jun. 3, 1977, Ser. No. 803,336
Int. Cl.[2] B31B *1/20*
U.S. Cl. 93—58.3 **6 Claims**



1. A method of forming a cutting, scoring and embossing die set comprising the steps of:

(a) forming a first die by:

(1) forming slots and an aperture in a support for a cutting rule, a scoring rule and a mounting block,

(2) inserting a cutting rule and a scoring rule in the slots and inserting a mounting block in the aperture;

(3) attaching the cutting and scoring rules and the block to the support, and

(4) providing first embossing means for attachment to the mounting block;

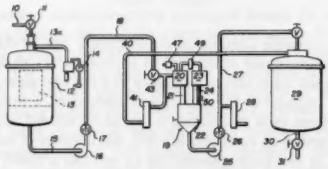
(b) forming a mating die including mating means for cooperating with the cutting and scoring rules and mating embossing means for cooperating with the first embossing means on the first die;
(c) registering the first embossing means of the first die with the mating embossing means of the mating die; and
(d) securing the first embossing means to the mounting block while the first embossing means and the mating embossing means are in registration.

4,112,828

REFLUX DEAERATION SYSTEM

Harry G. Mojonnier, River Forest, and Sigmund P. Skoli, Elmwood Park, both of Ill., assignors to Mojonnier Bros. Co., Chicago, Ill.

Continuation of Ser. No. 654,596, Feb. 2, 1976, abandoned. This application Aug. 2, 1977, Ser. No. 821,215
Int. Cl.[2] C02D *1/04*
U.S. Cl. 99—275 **12 Claims**



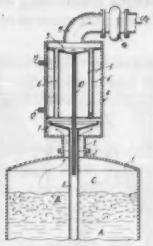
1. In a beverage processing system comprising a source of treated water containing dissolved air, a proportioner for adding beverage ingredients to the water to form a beverage, a first conduit means connected between the source of treated water and the proportioner, pump means connected in the first conduit means for pumping the water from the source to the proportioner at a given low pressure, a combined carbonator and cooler unit for cooling the beverage and for primarily adding carbon dioxide gas to the beverage to form a carbonated beverage, first conduit extending means between the proportioner and the combined carbonator and cooler unit for delivering the beverage from the proportioner to the combined carbonator and cooler unit, means for introducting carbon dioxide into the combined carbonator and cooler unit at a given high pressure, said high carbon dioxide pressure being greater than said low water pressure in said first conduit means, the improvement comprising second conduit means connected between the combined carbonator and cooler unit and a point in the first conduit means, the point being located between the pump means and the proportioner means, the second conduit means being provided for preliminarily introducing carbon dioxide gas, at the given carbonator and cooler unit high pressure, from the combined carbonator and cooler unit to the water at the given water low pressure in the first conduit so as to drive out air dissolved in the water by replacing the dissolved air with carbon dioxide gas, and check valve means for prohibiting the flow of water and gas backward along the first conduit toward the pump means and water source, and exhaust means connected to the proportioner for exhausting said air and undissolved carbon dioxide from the system.

4,112,829

APPARATUS FOR PURIFYING CARBON DIOXIDE VAPORS OF FERMENTING LIQUIDS

Elisabeth Michèle Poinsard, and Robert Gaston Poinsard, both of Le Boucaret, France, assignors to Establissement Valvin, Vaduz, Liechtenstein

Filed Oct. 13, 1976, Ser. No. 732,065
Int. Cl.[2] C12F *3/02*
U.S. Cl. 99—277 **7 Claims**



1. In combination with a container of fermenting liquids, notably in a vinificator, a recuperation and carbonic-gas purifying apparatus comprising:
a condenser, connected to said container to receive carbonic gas to be purified by the removal of vapors contained therein, for condensing said vapors;
a refrigerating unit connected to said condenser, and
means for extracting purified carbonic gas from the condenser;
means for returning the liquid condensate of said vapors from the condenser to the container,
said condenser comprising a body fixed on and connected to an upper part of the container by a delivery member, said body having an inner part, a series of reflux tubes through which the carbonic gas passes and in which said vapors reflux, said reflux tubes being housed in the inner part of the body and including a plurality of hemispherical baffles vertically spaced on a pair of carrying bars each of said baffles being provided with an orifice, said orifice of adjacent baffles being laterally offset from one another to provide a tortuous path for said vapours within said reflux tubes, and means for circulating a refrigerating fluid from said refrigerating unit to said inner part of the condenser body, said condensate returning means including in a lower part of said body, under said reflux tubes, a funnel having a delivery tube which in use extends into the fermenting liquid in said container, and said extracting means further including an exhaust pipe connected to an upper part of said body to evacuate the purified carbonic gas.

4,112,830

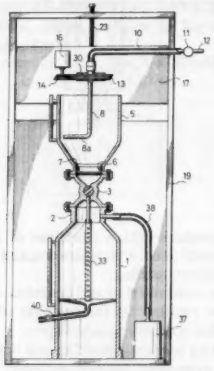
EXTRACTING BLACK TEA AND COFFEE AND CLOSED EXTRACTOR THEREFOR

Isamu Saito, 201, 3-12, 1-chome, Akabanedai, Kita-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 427,246, Dec. 21, 1973, abandoned. This application Jan. 15, 1976, Ser. No. 649,230
Claims priority, application Japan, Dec. 27, 1972, 48/590
Int. Cl.[2] A47J *31/057*
U.S. Cl. 99—300 **7 Claims**

1. Coffee and tea making apparatus comprising, a liquid-receiving tank for containing a tea or coffee filtrate therein in a vacuum-tight manner, an immersing tank mounted above the liquid-receiving tank for receiving heaped tea or coffee therein, a filter in said immersing tank upstream of the liquid-receiving tank, driven sprinkler means in said immersing tank spaced in use from said heaped tea or coffee therein for sequentially sprinkling next adjacent areas of heaped tea or coffee when driven to successive positions overlying said areas with

periods of sprinkling each followed immediately by a period of non-sprinkling of the previously wetted area until said coffee or tea is well wet-expanded in said immersing tank for making a tea or coffee filtrate filtered through said filter, drive means for continuously rotating said sprinkler means several rotations during operation for sequentially sprinkling said areas of said heaped tea or coffee each during a sprinkling period of wetting with each period of sprinkling immediately followed by a sequential period of non-wetting of a previously wetted area, the periods of non-wetting constituting expansion intervals of the tea or coffee before a next successive wetting period and



sequential expansion interval thereby to preclude collapse of the wetted tea or coffee during the sprinkling, means for connecting said sprinkling means to a source of unheated tap water for sprinkling said water on said heaped tea or coffee, valve means for providing selective communication between the two tanks for selectively allowing filtrate passed through said filter to enter said liquid-receiving tank, and means for periodically drawing filtrate from said liquid-receiving tank as a tea or coffee drink.

4,112,831

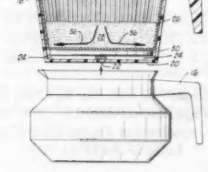
COFFEE BLENDERS

Herman B. Scott, 7 S. Pennsylvania, Oklahoma City, Okla. 73107

Filed Apr. 14, 1977, Ser. No. 787,544

Int. Cl.[2] A47J *31/00*

U.S. Cl. 99—306 **3 Claims**



1. A device for use in combination with a drip coffee blender of the type where heated water is released through a holder containing filter paper and dry coffee grounds for blending and final release of brewed coffed into a holding pot, the improvement device comprising:

a disc member generally shaped to the same size and configuration as the bottom panel area of said filter paper and being disposed between the bottom of said filter paper and the bottom of said holder receptacle, said disc member being formed from solid material to be relatively thin as compared to the diameter whereby water released through said holder is diverted radially before final release of the brewed coffee.

4,112,832

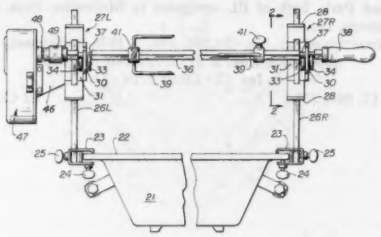
ROTISSERIE AND CLOCKWORK MOTOR THEREFOR

Anton Severdia, 918 Washington St., Oakland, Calif. 94070, and Adrian Joseph, 127 Boyo Vista, Oakland, Calif. 94611

Filed Jan. 24, 1977, Ser. No. 761,868

Int. Cl.[2] A47J *37/04*

U.S. Cl. 99—421 HH **8 Claims**



1. A rotisserie attachment comprising a pair of stanchions, means holding said stanchions in approximately parallel relation to each other and in proximity to a fire container, a clamp slidably adjustable on each of said stanchions, a bracket projecting from each said clamp, a first and a second roller rotatably mounted on each said bracket, the outlines of said rollers viewed in elevation intersecting to provide a space between their upper peripheries, said bracket extending horizontally away from said stanchion and being formed on its upper edge with a notch, said rollers being mounted on either side of said notch and said space being within said notch, a spit fitting into said space, whereby said rollers support the entire weight of said spit and its contents, a motor, means mounting said motor from one of said stanchions, and drive means to turn said spit from said motor.

4,112,833

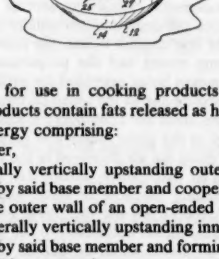
MICROWAVE COOKING DEVICE

Roy N. Oda, and Lorraine K. Oda, both of 1553 Copper Lantern Dr., Hacienda Heights, Calif. 91745

Filed Oct. 25, 1977, Ser. No. 844,889

Int. Cl.[2] H05B *9/06*; A47S *27/00*

U.S. Cl. 99—425 **15 Claims**



1. A utensil for use in cooking products by microwave wherein the products contain fats released as hot grease during the cooking energy comprising:

a base member,

a first generally vertically upstanding outer shell member supported by said base member and cooperating therewith to form the outer wall of an open-ended container,

a second generally vertically upstanding inner shell member supported by said base member and forming the wall of an open-ended inner container,

said inner shell member being spaced from said outer shell member and cooperating with said outer shell member to form a chamber between said inner and outer shells,

said inner shell member including means forming an aperture therein to permit flow of fat between the chamber and inner container, at least said first and second shells being of a microwave transparent material, and

said base being of a material stable against deformation when contacted by hot grease.

4,112,834

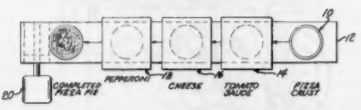
FOOD PROCESSING APPARATUS

Geza A. Thiry, 6204 Washington St., Ravenna, Ohio 44266

Filed Jan. 19, 1976, Ser. No. 650,558

Int. Cl.[2] A23P *1/00*

U.S. Cl. 99—450.1 **19 Claims**



1. Apparatus comprising first conveyor means for sequentially moving pizza shells along a first path through a first food processing station and through a second food processing station, said first food processing station comprising means for supporting a body of cheese, first cutting means at said first food processing station for cutting elongated pieces of cheese from said body of cheese, second cutting means at said first food processing station for cutting the elongated pieces of cheese into relatively short lengths, means for guiding the short lengths of cheese toward a location at which the short lengths of cheese are associated with a pizza shell as it is moved through said first food processing station under the influence of said first conveyor means, said second food processing station comprising means for supporting a body of pepperoni, blade means for severing pieces of pepperoni from said body of pepperoni, second conveyor means for receiving severed pieces of pepperoni and for moving the severed pieces of pepperoni along a path toward a location at which the severed pieces of pepperoni are associated with a pizza shell as it is moved through said second food processing station under the influence of said first conveyor means, said second conveyor means including surface means movable along at least a portion of said second path for applying a force to the severed pieces of pepperoni to positively move the severed pieces of pepperoni along said second path, said first conveyor means including drive means for effecting continuous operation of said first conveyor means to move pizza shells through said first and second food processing stations at a substantially constant speed, said second conveyor means including means for moving said surface means and the severed pieces of pepperoni disposed thereon in timed relation to the speed that pizza shells are moved through said first and second food processing stations by said first conveyor means.

4,112,835

CHEESE PROCESSING SYSTEM

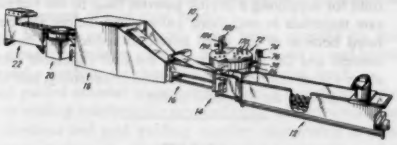
Angelo Mongiello, 820-62nd St., Brooklyn, N.Y. 11220

Filed Feb. 18, 1977, Ser. No. 770,107

Int. Cl.[2] A23C *3/04*

U.S. Cl. 99—455 **2 Claims**

1. A cheese processing system comprising, in combination: means for feeding product to an elevating location, means disposed at said elevating location for elevating the product to bottommost portions of and thereafter into a plurality of forms at an input station, means for rotating the forms which contain product form said input station along a path to a discharge station, fluid means for cooling outer surfaces of said forms without contacting product therewithin, and positive ejection



means for urging substantially packagingready formed and cooled product from said forms at said discharge station.

4,112,836

APPARATUS FOR TREATING OIL CONTAINING VEGETABLE RAW MATERIALS

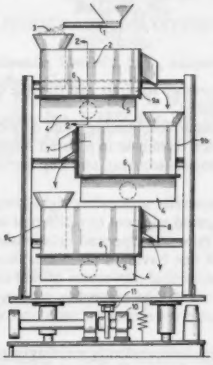
Johan Frederik Witte, Amsterdam-Nieuwendam, Netherlands, assignor to Stork Amsterdam B.V., Sportlaan, Amstelveen, Netherlands

Continuation of Ser. No. 443,844, Feb. 19, 1974, abandoned. This application Jan. 5, 1976, Ser. No. 646,867

Claims priority, application Netherlands, Feb. 20, 1973, 7302358

Int. Cl.[2] A27C *3/02*

U.S. Cl. 99—483 **3 Claims**



1. An installation for pre-treating oil-containing vegetable raw materials in order to allow the extraction of oil from the vegetable raw materials comprising:

(a) a first vibratory gutter having a perforated bottom and provided with means for subjecting the gutter to vibratory movement having a vertical component, said first gutter having a steam supply-opening connected to a source of steam pressure below said first gutter in order to subject the oil-containing vegetable raw material to a pre-treatment, said gutter having an overflow outlet;

(b) a second vibratory gutter having a perforated bottom and provided with means for subjecting the second gutter to vibratory movement having a vertical component, said second gutter having an inlet positioned below the outlet of the first gutter for receiving the material treated in the first gutter, means connected to a source of heated fluid for introducing a heated fluid below the perforated bottom of said second gutter in order to maintain the finely divided vegetable raw material at a temperature from 95° to 115° C. in said second gutter to inactivate enzymes having a detrimental action on the oil, said second gutter having an overflow outlet; and

(c) a third gutter having a perforated bottom and provided with means for subjecting the third gutter to vibratory movement having a vertical component, said third gutter

having an inlet positioned below the outlet of the second gutter for receiving the treated material from the second gutter, means connected to a source of drying gaseous fluid for supplying a drying gaseous fluid to the vegetable raw materials in said third gutter from below the perforated bottom of the third gutter to reduce the moisture content and the temperature of the raw vegetable materials to values required for extraction or crushing, said third gutter having an overflow outlet.

4,112,837

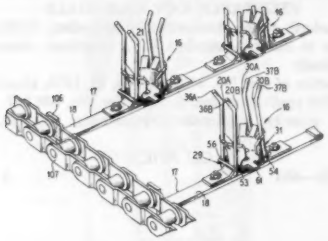
HOLDER FOR FRUIT AND THE LIKE

James E. Altman, and Eston Altman, both of Gray, Ga. 31032

Filed Jun. 23, 1976, Ser. No. 698,798

Int. Cl.[2] A23N *15/02*; B65G *47/22*

U.S. Cl. 99—537 **22 Claims**



1. A holder assembly for fruit and the like comprising

(A) a base member,

(B) a cup member for holding fruit defined by side wall portions which terminate in a flared mouth,

(C) mounting means securing said cup member to said base member,

(D) a pair of generally upstanding rigid grasping arms, each one being located adjacent to a different outside region of said side portions in opposed relationship to the other thereof, each one having a pivot axis located below said mouth for reciprocal movement of said one arm towards and away from its said respective region,

(E) independent pivot means for each one of said arm pairs, and

(F) spring means independently yieldingly generally equally biasing each arm towards its said respective region, thereby permitting independent movement of each one of said arm pairs.

4,112,838

HALVING AND CALYX REMOVING APPARATUS FOR PEARS AND THE LIKE

James E. Altman, and Eston Altman, both of Gray, Ga. 31032

Filed Jun. 23, 1976, Ser. No. 698,849

Int. Cl.[2] A23N *15/02*

U.S. Cl. 99—546 **10 Claims**

7. Automatic continuously operable apparatus for sequential halving and calyx removal of each of a plurality of pears or the like comprising

(A) a supporting frame assembly,

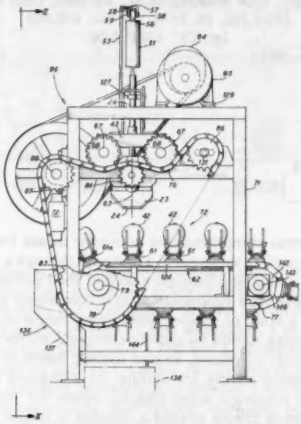
(B) a blade assembly comprising a flattened blade member for splitting a pear, a blade shaft means associated therewith, and associated support means for supporting and guiding said blade shaft during reciprocal movements of said blade member relative to an edge portion thereof in a plane defined thereby,

(C) first drive means for so reciprocally moving said blade member through predetermined cycles of reciprocal movement, including transfer means functionally associating said drive means with said blade shaft,

(D) a plurality of holder means, each adapted for positioning and supporting a pear or the like generally axially of said blade shaft,

(E) a pair of sheet-like members each conforming generally to a tapered section with the smaller edge thereof having a cutting edge surface defined therealong for removing the calyx region of a pear as said pear is split,

(F) mounting means securing each one of said sheet-like members in opposed relationship to the other thereof and to said blade member with said respective tapered sections defining together generally a conical section and with said blade member extending transversely therebetween, the taper of said conical section extending generally towards said cutting edge portion, said conical section being oriented with said smaller circular edges thereof being in spaced relationship to said cutting edge portion



(G) continuously movable conveyor means for translating each of said holder means in a fixed path into and away from a predetermined position beneath said flattened blade member,

(H) control means for synchronizing reciprocations of said blade shaft means relative to each of said holder means as such continuously translate generally tranversely relative said shaft means by said conveyor means, said holder means being in generally equally spaced, longitudinally aligned relationship to one another as respects the direction of such translation.

4,112,839

APPARATUS FOR CONNECTING THE TYING MEANS ENDS ON TYING MACHINES

Hans Hugo Büttner, Obmettmann 13, 4020 Mettmann, Fed. Rep. of Germany

Filed Mar. 14, 1977, Ser. No. 777,098

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1976, 2616033

Int. Cl.[2] B65B *13/24*

U.S. Cl. 100—33 PB **11 Claims**

1. An apparatus for connection of the ends of a tying means at a tying position on tying machines, comprising:

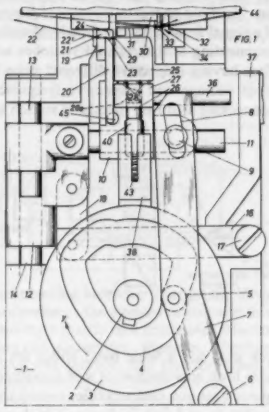
means for connecting the ends of the tying means including an upper pressing jaw means and a lower pressing jaw means for cooperatively pressing the ends of the tying means together in a pressing position,

a gripper means for holding one of the ends of the tying means, said gripper means mounted displaceable from one side of the tying position to the other side, said gripper means having side surfaces,

a cutter-knife means for separating the tying means being arranged on said lower pressing jaw means adjacent to

and for cooperating with said gripper means so as to cut the tying means during a relative movement,

said lower pressing jaw means being arranged directly adjacent one of said side surfaces of said gripper means and being mounted displaceable with and relative to the latter,



means for moving said gripper means and said lower pressing jaw means jointly with and relatively to each other, respectively.

4,112,840

DRIVING DEVICE FOR A PRINT HEAD

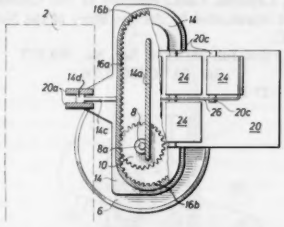
Gösta Roland Englund, Stockholm, Sweden, assignor to Svenska Dataregister Aktiebolag, Sweden

Filed Jun. 17, 1976, Ser. No. 697,187

Claims priority, application Sweden, Jun. 30, 1975, 7507468

Int. Cl.[2] B41J *9/04*

U.S. Cl. 101—93.15 **4 Claims**



1. A driving device for a print head including printing means actuated at predetermined times for marking characters on a data carrier carried by a print roll, comprising:

motion converting means comprising a housing including an interior continuous gear path;

said housing being coupled to said print head;

said gear path comprising a pair of opposing straight path portions substantially parallel to the axis of said print roll; said straight path portions being joined, at each end thereof, by respective curved path portions;

rotatable pinion means in continual engagement with said gear path;

said pinion means being coupled to the shaft of a motor driving means;

said straight path portions being mutually separated by a distance greater than the outside diameter of said pinion means and said curved path portions being mutually separated by a distance substantially greater than the distance separating said straight path portions;

rotary motion of said pinion means being converted to reciprocating movement of said housing and corresponding movement of said print head;

said housing and said print head being coupled by guide means comprising a guided member joined to said housing and a guiding member joined to said print head;

said guided member comprising at least a pair of projections extending substantially perpendicular to said straight path portions and said guiding member comprising at least a pair of channels, each one receiving a respective projection;

said projections being capable of relative movement within said respective channel in a direction perpendicular to said straight path portions and said channels preventing relative movement with respect to its respective projection in a direction parallel to said straight path portions;

said guide means permitting movement of said housing and said print head in a direction substantially parallel to the axis of said print roll whenever said pinion engages said straight path portions and

said guide means allowing movement of said housing in a direction substantially perpendicular to the axis of said print roll whenever said pinion engages said curved path portions.

4,112,841

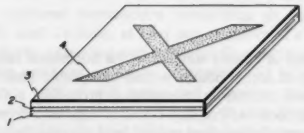
RESILIENT LITHOGRAPHIC MASTERS FOR DIRECT PRINTING

Narayan V. Deshpande, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 601,005, Aug. 1, 1975, abandoned. This application Jan. 7, 1977, Ser. No. 757,714

Int. Cl.[2] B41F *7/00, 13/08*

U.S. Cl. 101—141 **2 Claims**



1. In a direct printing process of transferring an inked image directly from the printing master to a receiving sheet, the improvement comprising employing a master consisting essentially of a suitable supporting substrate, a resilient layer between 25 and 200 microns on said substrate, said layer having a Shore A durometer of between 30 and 80, a surface layer and an image layer of up to 2.5 microns and supporting the receiver sheet by a resilient blanket having a Shore A durometer between about 70 and 90.

4,112,842

DRIVE FOR SHEET-FED ROTARY PRINTING PRESSES WITH AT LEAST TWO TANDEM-MOUNTED PRINTING UNITS

Willi Jeschke, Heidelberg-Boxberg, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Aug. 9, 1974, Ser. No. 496,169

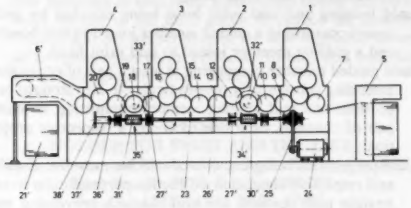
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1973, 2354541; Aug. 9, 1973, 2340263

Int. Cl.[2] B41F *5/02*

U.S. Cl. 101—183 **3 Claims**

1. Drive for sheet-fed rotary printing machines with at least two tandem-mounted printing units having a drive motor, comprising a closed gear train connecting the printing units to each other, a continuous main drive shaft driven by the drive

motor and extending parallel to said closed gear train, and main drive shaft being mounted so as to be axially displaceable, a pair of drive worms having opposing pitch directions secured on said main drive shaft, worm gears in meshing engagement



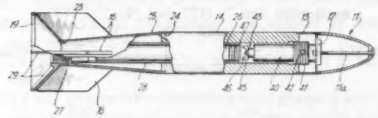
with said drive worms and connecting said main drive shaft thereby to said closed gear train at two force input locations, and force generating means comprising a force generator exerting a force on one end of said main drive shaft in axial direction thereof.

4,112,843

MODULAR PRACTICE BOMB

Maurice A. Laviolette, Quebec, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Jan. 6, 1977, Ser. No. 757,215
Claims priority, application Canada, Aug. 16, 1976, 259143
Int. Cl.[2] F42B *25/02*
U.S. Cl. 102—7.6 **14 Claims**



7. A method of closely simulating the horizontal range of a wide variety of actual bombs within acceptable limits under various release conditions, comprising providing a standard configuration Modular Practice Bomb of fixed effective diameter and substantially constant weight, and varying the coefficient of drag of the Modular Practice Bomb to provide a close match of the ballistic coefficient and horizontal range of the Modular Practice Bomb with that of a predetermined actual bomb, while maintaining flight stability, within a specified release envelope by calculating the drag coefficient of said practice bomb required to match the drag coefficient of said actual bomb and increasing the drag coefficient of said practice bomb to said calculated value by providing the practice bomb with a detachable tail-mounted module of an appropriate configuration.

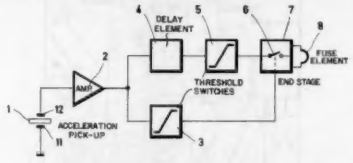
4,112,844

RELEASING DEVICE WITH PRESET RESPONSE SENSITIVITY FOR ELECTRICAL FUZES FOR USE WITH MINES

Manfred Held, Kuhbach, and Hans Spies, Pfaffenhofen, both of Germany, assignors to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung, Munich, Germany

Filed Sep. 1, 1971, Ser. No. 177,179
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1970, 2047422
Int. Cl.[2] F42C *15/14*
U.S. Cl. 102—19.2 **1 Claim**

1. Releasing device, having a preset sensitivity, for electrical fuzes for use with mines, comprising, in combination, a piezoelectrical acceleration pick-up; first and second circuits electrically connected, in parallel with each other, to said pick-up; said first circuit including a first threshold switch, and said second circuit including a delayed-response second threshold switch having a threshold value different from that of said first threshold switch; a fuze element operatively associated with both said circuits; switch means actuable by said threshold switches and controlling energization of said fuze element; said switch means blocking energization of said fuze element in the presence of a signal from said first threshold switch; respective amplifiers connecting said threshold switches to said pick-up; said amplifiers having respective different gains for respective different input voltage and respective frequency ranges; the amplifier connecting said first threshold switch to said pick-up



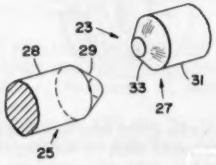
having a low gain and a wide band width for input voltages resulting from high acceleration of said acceleration pick-up in higher frequency ranges; said amplifier connecting said second threshold switch to said pick-up having a high gain and narrow band width for input voltages resulting from low acceleration of said acceleration pick-up in low frequency ranges; said switch means including an AND-gate having an output controlling energization of said fuze element and respective inputs electrically connected to said first and second threshold switches; and a monostable trigger stage connecting said first threshold switch to the associated input of said AND-gate and, when non-operative, supplying a signal voltage to said AND-gate.

4,112,845

APPARATUS FOR DETONATING ACROSS A GAP

Jacob Savitt, Capitola, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 28, 1976, Ser. No. 709,577
Int. Cl.[2] C06C *5/06*
U.S. Cl. 102—27 R **4 Claims**



1. An apparatus for detonating across a gap comprising:
(a) a donor charge of an explosive material in a tubular casing
(b) an acceptor charge of an explosive material in a tubular casing; and
(c) means for causing detonation of said acceptor charge by said donor charge across said gap therebetween when said charges are misaligned from each other, said means being end tips on each of said donor and acceptor charges of non-cylindrical configuration, the configuration of said end tips being a function of the misalignment between said donor charge and said acceptor charge.

4,112,846

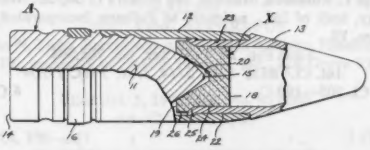
ARMOR-PIERCING INCENDIARY PROJECTILE

Henry L. Gilbert, Compton, and Cayrl W. Van Ordstrand, Redondo Beach, both of Calif., assignors to Martin Marietta Aluminum Inc., Torrance, Calif.

Continuation-in-part of Ser. No. 477,077, Jun. 11, 1966, abandoned, which is a continuation-in-part of Ser. No. 360,554, Apr. 16, 1954, abandoned. This application Dec. 19, 1966, Ser. No. 602,852

Int. Cl.[2] F42B *11/14*

U.S. Cl. 102—52 14 Claims



1. In an armor-piercing incendiary projectile having a penetrator and an incendiary, the improvement which comprises: an incendiary having a matrix of a first metal selected from the group consisting of zirconium, titanium, thorium, hafium, uranium, and mixtures thereof; and interdispersed therein an intermetallic compound formed between said first metal and a second metal selected from the group consisting of tin, lead, and mixtures thereof.

4,112,847

WARHEAD WITH A DISINTEGRATING JACKET TO HOUSE SEVERAL PROJECTILES

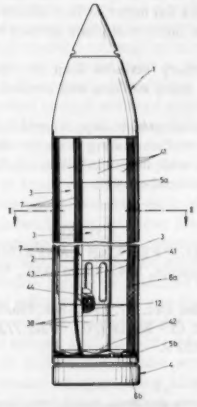
Franz Rudolf Thomanek, Sandizell, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung, Munich, Germany

Filed Dec. 8, 1970, Ser. No. 97,451

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1969, 1961881

Int. Cl.[2] F42B *13/50*; F42C *11/00*

U.S. Cl. 102—67 11 Claims



1. A warhead with an disintegrating jacket to house several projectiles, in particular splinter projectiles, each of them being equipped with an ignition and backfiring charge system, and each falling to earth individually after disintegration of the warhead jacket, and being fired upwards from the ground by means of the backfiring charge system ignited by the ignition system, said ignition system comprising a time-delay fuze, which is initiated when the projectile impacts with relatively soft ground and which ignites the backfiring charge after adjusted times differing at least partly for the individual projectiles, and an impact fuze, which effects an immediately ignition of the backfiring charge when the projectile strikes relatively hard ground.

4,112,848

WARHEAD CONSTRUCTION

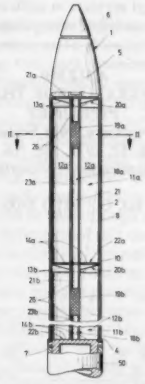
Georg Lallinger, Muhlried, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung, Munich, Germany

Filed Nov. 2, 1970, Ser. No. 86,282

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1969, 1955777

Int. Cl.[2] F42B *13/50*

U.S. Cl. 102—69 12 Claims



1. A warhead construction comprising an outer tubular jacket for said warhead, at least one assembly of a plurality of longitudinally extending and substantially coextensive circumferentially arranged explosive charges in said jacket adjacent the interior wall of said jacket and defining a longitudinally extending hollow space at the center of said charges, and an ejection cartridge located within said hollow space adjacent one end of said charges, said jacket having a plurality of circumferentially spaced breaking seams extending longitudinally along the length thereof and overlying said assembly in a position to break from the ejection cartridge end toward the opposite wall upon ignition of said cartridge to permit the spreading out of said charges, said ejection cartridge producing pressure forces which act first upon the ends of said explosive charges which are adjacent to said cartridge and which thereafter, upon pressure burning of said explosive charges in a progressive manner toward the opposite ends thereof, cause progressive and uniform separation and breaking away of said jacket along said breaking seams toward the opposite end.

4,112,849

SMOKELESS SLOW BURNING CAST PROPELLANT

John Leslie Jones, Los Angeles, Calif., assignor to California Institute Research Foundation, Pasadena, Calif.

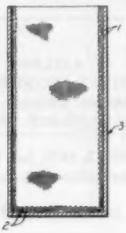
Filed Feb. 11, 1949, Ser. No. 75,755

Int. Cl.[2] F42B *1/00, 33/10*; C06B *45/10, 21/00*

U.S. Cl. 102—103 10 Claims

1. A cast, combustible composition comprising: granular ammonium nitrate; catalytic amounts of a powdered combustion catalyst intimately mixed with the ammonium nitrate, said catalyst being selected from the group consisting of zirconium hydride, cobalt, nickel, alloys of cobalt, nickel, and zirconium,

and the oxides of cobalt and nickel; and an elastic, combustible, crosslinked, resinous fuel consisting of a copolymer which is



preponderantly methyl acrylate in sufficient amount to fill the voids between the granules of ammonium nitrate and catalyst.

4,112,850

CONVEYOR APPARATUS FOR THE INTERIOR OF PIPELINES

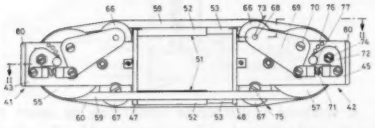
Alwin Sigel-Gfeller, Nussberg, 8418 Schlatt, Switzerland

Filed Feb. 17, 1977, Ser. No. 769,452

Claims priority, application Switzerland, Feb. 24, 1976, 2258/76

Int. Cl.[2] F17D *5/00*

U.S. Cl. 104—138 G **13 Claims**



1. Conveyor apparatus for moving test devices through the interior of a pipeline which is inaccessible without digging into the ground comprising:

first and second chassis sections, each said chassis sections having a longitudinal axis and each being symmetrical thereabout and means connecting said chassis sections to each other for movement together and for movement relative to each other in an axial direction parallel to the axis of the pipeline;

each said chassis section including first and second guide rollers and first and second swivel rollers, said guide rollers being substantially equally diametrically spaced from the longitudinal axis and being fixed for rotation to said chassis section, and said swivel rollers being diametrically spaced from the longitudinal axis and being fixed for rotation to said chassis section;

said connection means consisting of a telescoping arrangement of the sections with a pressure spring between opposing axially disposed surfaces of the sections and first and second endless belts disposed around the sections that counteract the action of the pressure spring, said first belt being carried by said first guide rollers, and being in contact with said first swivel rollers, said second belt being carried by said second guide rollers and being in contact with said second swivel rollers;

a swing plate for each said swivel roller coupled to one of said chassis sections, each said swivel roller being coupled to its said respective swing plate, said swing plates being individually adjustable to adjust the spacing between said swivel rollers in a diametrical direction transverse to the longitudinal axis of said chassis section, said swivel rollers being adjustable both in a direction towards the longitudinal axis and away from the longitudinal axis so that the longitudinal axis of said chassis can be centered within the interior of the pipeline substantially coinciding with the pipeline axis; and,

spring means connected with said chassis section operative to urge said swivel rollers into contact with the interior wall of the pipeline whereby to take care of minor variations in the diameter of the pipeline.

4,112,851

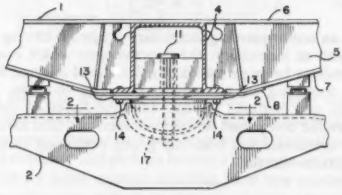
RESILIENT CONSTANT CONTACT CENTER BEARING ASSEMBLY

George L. Rousseau, Munster, and Richard C. Snyder, Michigan City, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Feb. 25, 1977, Ser. No. 765,504

Int. Cl.[2] B61F *1/14, 5/14, 5/20;* F16C *17/04*

U.S. Cl. 105—199 C **6 Claims**



1. A vibration damping center bearing assembly for a railway vehicle including a car body bolster and a supporting wheel truck having a transverse truck bolster including upper horizontal plate portions extending between its ends,

a bowl supported on said truck bolster having a peripheral rim flange extending upwardly beyond said plate portions and a downwardly concave curved inner surface generally semi-ovoidally shaped,

a shiftable insert disposed in said bowl having a generally semi-ovoidal lower surface contiguous to the inner surface of the bowl in radial and vertical load supporting relation thereto and a flat upper surface within a bowl and substantially in the horizontal plane defined by said upper plates portions,

a complementary resilient liner interposed between said lower and inner surfaces and bonded to one of said surfaces, and

a center plate adapted to support said body bolster having a flat lower surface mating with the flat upper surface of said insert and supported thereon for relative rotative movement therebetween.

4,112,852

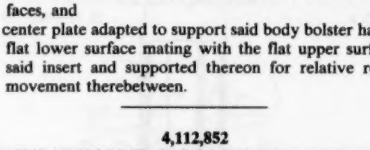
RAILWAY HOPPER CAR LABYRINTH GATE SEAL

Clarence J. Koranda, 5042 Lawn Ave., Western Springs, Ill. 60558

Filed Dec. 27, 1976, Ser. No. 754,836

Int. Cl.[2] B61D *7/02, 7/20, 7/22, 7/26*

U.S. Cl. 105—282 A **10 Claims**



1. In a hopper outlet chute having a discharge opening defined by a sidewall frame with a sliding plate gate operating in the opening and an undercarriage support frame fixed to the chute sidewall frame to support the gate for sliding movement

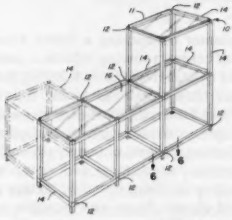
relative the opening, an improved gate seal comprising an upwardly directed gate flange integrally formed on at least part of the periphery of the gate plate, the flange being disposed on the outside of the chute frame, a pair of spaced elongated seal elements disposed in the space betweeen the gate flange and the adjacent hopper sidewall frame with one of the seal elements being fixed to the gate and the other to the adjacent chute sidewall frame and with both seal elements defining a tortuous labyrinth gap therebetween which serves as a seal for any granular matter within the chute.

4,112,853

SHELVING APPARATUS

Cosmo N. Tisbo, Barrington, and Thomas A. Tisbo, Roselle, both of Ill., assignors to Custom Plastics, Inc., Elk Grove Village, Ill.

Filed Jul. 5, 1977, Ser. No. 812,668
Int. Cl.[2] F16B *7/00*
U.S. Cl. 108—111 **2 Claims**



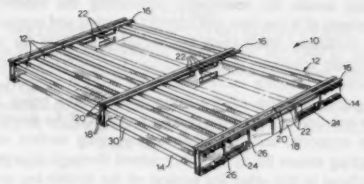
1. A shelving apparatus for holding articles comprising: a plurality of unitary molded joint connectors composed of high impact styrene, each unitary molded joint connector of said plurality having a hollow cubical center section and a plurality of arms having U-shaped cross-sections extending from the hollow cubical center section, each arm being positioned substantially perpendicular to a respective face of said hollow cubical center section, each arm of said plurality of arms having a first substantially rectangular wall extending the length of the arm, a second substantially rectangular tapered wall being formed integral with and perpendicular to the first substantially rectangular wall, a third substantially rectangular tapered wall being formed integral with and perpendicular to the first substantially rectangular wall, said second and third substantially rectangular tapered walls each having a respective free edge, each of said arms having a pair of beads formed therein, each pair of beads on a given joint connector being parallel to each other pair of beads on each other arm of that joint connector; the beads in at least one arm extending the length of said arm outwardly from said center section, a plurality of stringers composed of high impact styrene, each of said stringers having a hollow square cross-section interior, each of said stringers having a first rectangular stringer wall, a second rectangular stringer wall, a third rectangular stringer wall and a fourth rectangular stringer wall, each of said extruded stringers being adapted to receive one of said arms of said joint connectors, said extruded stringers being adapted to fit flush with said hollow cubical center sections; and a plurality of frosted square shelves, each of said frosted square shelves having a plurality of right angle notches formed in a plurality of shelf corners, each of said frosted square shelves of said plurality having a plurality of pins, each pin of said plurality of pins being positioned adjacent a respective right angle notch, each shelf of said plurality being adapted to be positioned in contact with one or more of said extruded stringers in an abutting relationship with other shelves of said plurality, each shelf being composed of a general purpose styrene.

4,112,854

METAL PALLET

Peter R. Pitchford, 188 Grenadier Rd., Toronto, Ontario, Canada (M6R 1R7)

Filed Oct. 7, 1977, Ser. No. 840,435
Int. Cl.[2] B65D *19/28*
U.S. Cl. 108—56.1 **14 Claims**



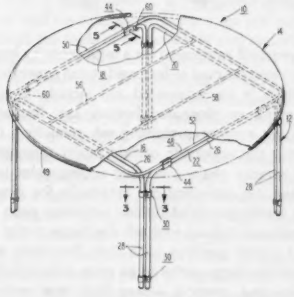
1. In a pallet having coplanar, adjacent deck members defining a load bearing surface, and a plurality of transverse stringer members supporting the deck members, the improvement comprising: a pair of parallel spaced-apart, generally U-shaped stringer members having generally upright, laterally resilient sides defining longitudinally spaced-apart, transverse openings located adjacent to the upper marginal edges of the sides; a plurality of coplanar, parallel, laterally spaced-apart, elongate deck members having longitudinal, downwardly and outwardly disposed, laterally resilient sides, the ends of the deck members being adapted to pass through said stringer openings upon lateral inward deflection of said deck member sides; and the deck member sides defining opposed pairs of parallel slot openings located adjacent to the deck member ends, the longitudinal spacing between said slot openings being different than the normal transverse spacing between the stringer sides, so that upon assembly of the pallet, the stringer and deck member sides are laterally deflected, the peripheral edges of said stringer openings are located in said slot openings, and the deck members and stringer members are biased into mutual engagement.

4,112,855

FOLDABLE FURNITURE UNIT

Donald B. Colby, Los Angeles, Calif., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Sep. 29, 1977, Ser. No. 837,894
Int. Cl.[2] A47B *3/06*
U.S. Cl. 108—159 **6 Claims**



1. A folding table including a tabletop that is removably connected to, and completely separable from a foldable base framework; the improvement wherein the framework includes a plurality of support members, each support member having a horizontal cross-piece joined at opposite ends to vertically dispose leg sections, each leg section of each support member

being adjacent to and substantially vertically aligned with a leg section of a different support member to provide a plurality of double-leg section supports, each double-leg section support being horizontally spaced from an adjacent double-leg section support by the horizontal cross-piece of a support member to provide ample leg room for accommodating individuals about substantially the entire perimeter of the tabletop, tabletop retaining means for removable connecting the tabletop to cross-pieces of more than one support member and connecting means including space-apart leg-engaging sections for rotatably joining together, in a spaced-apart relationship, the two leg sections forming each double-leg section support, one leg-engaging section of the connecting means being fixed against rotation to one of the two leg sections of the double-leg section supports, and the other leg-engaging section of the connecting means being rotatably joined through interengaging surfaces to the other leg section of the double-leg section supports, whereby the other leg sections of the double-leg section supports constitute the axes of rotation about which the support members can be rotated into a collapsed condition when the tabletop is removed from the framework, and interengaging surfaces also aiding in establishing and maintaining the desired relationship between the support members.

4,112,856

ASH REMOVAL EQUIPMENT ARRANGED ON A LIFTING MECHANISM FOR PULVERIZED-COAL FURNACES OF LARGE-CAPACITY STEAM GENERATORS

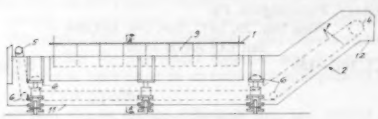
Günther Georg Fuhrman, Im Lerchenrain 16, 7000 Stuttgart 1; Uwe Jonny Krogmann, Stöckhofstr. 26/1, 7250 Leonberg, and Gerhard Wolfgang Schroth, Blautopfstr. 2, 7000 Stuttgart 61, all of Germany

Filed May 19, 1977, Ser. No. 798,351

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620836

Int. Cl.² F23J *1/02*

U.S. Cl. 110—165 R **6 Claims**



1. In ash removal equipment for a high capacity steam generator using pulverized coal as fuel, said steam generator being of the type which is top suspended and includes a combustion chamber having an elongated bottom ash discharge outlet suspended over a water containing ash quenching trough extending along the underside of said outlet through which a submerged scraper chain conveyor arrangement is disposed for delivering the quenched ash externally for disposal, said bottom ash discharge outlet further including pairs of hinged trap doors disposed along said ash discharge outlet and movable from a closed position with their free ends meeting to close off said discharge outlet to an open substantially vertical downard hanging position where their free ends are submerged in said water and the doors form a protective hood along the sides of said trough to prevent entry of outside air into said combustion chamber, the improvement comprising adjustable lifting means supporting said trough for varying the relative vertical distance between said trough and the free ends of said trap doors when the latter are in said open position and for maintaining said free ends submerged in said water.

4,112,857

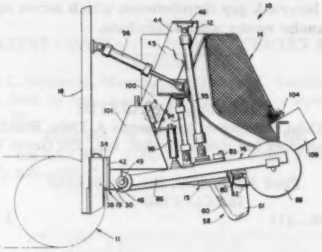
SPOT PLANTER

Edmund G. Bradley, Lithia Springs, Ga., assignor to Marden Manufacturing Company, Inc., Auburndale, Fla.

Filed Oct. 21, 1976, Ser. No. 734,547

Int. Cl.² A01C *11/00*

U.S. Cl. 111—3 **5 Claims**



1. A spot planter comprising a frame movable forwardly over the ground behind a towing vehicle, a passenger compartment supported by said frame and including means for supporting a passenger facing opposite to the forward direction of movement of said frame, dibble means mounted on said frame and movable up and down adjacent said passenger compartment to cut planting pockets along a path in the ground, seedling ejector means movable up and down with said dibble means for inserting seedlings into the planting pockets, packing means mounted on said frame and movable up and down beside and behind said dibble means to close the planting pockets, said packing means comprising a wheel including an annular ground engaging surface with one side portion of the annular ground engaging surface being of larger diameter than the other side portion thereof and with the larger diameter portion of said wheel being positioned away from the path of the planting pockets and the smaller diameter portion of said wheel being positioned adjacent the path of the planting pockets, said wheel being rotatable about an axis inclined upwardly from the position of the wheel toward the planting pockets and angled forwardly from the position of the wheel toward the line of the pockets whereby when the wheel engages the ground adjacent a planting pocket it tends to sweep the soil toward the planting pocket and to press the soil at a downward inclined angle toward the lower portion of the planting pocket substantially without reducing the height of the soil adjacent the seedling.

4,112,858

SEWING MACHINE WITH A PATTERN GENERATING DEVICE

Toshihide Kakinuma, Tokyo; Toshiaki Kume, Tachikawa; Hideaki Takenoya, Hachioji; Hachiro Makabe, Fussa, and Kazuo Watanabe, Hachioji, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1977, Ser. No. 769,796

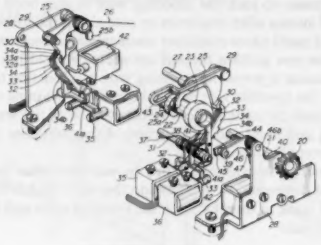
Claims priority, application Japan, Feb. 27, 1976, 51-20034

Int. Cl.² D05B *3/02*

U.S. Cl. 112—158 E **18 Claims**

1. In a sewing machine having a machine housing, a main shaft rotatably journaled in the machine housing, stitch forming instrumentalities movable to different positions defined by different respective position coordinates for changing the relative position between the needle and the sewn work in order to form stitches in a pattern, in combination, motion-generating means operative in synchronism with main shaft rotation for generating motion in a first path of motion; transmission means connected to the motion-generating means and to the stitch forming instumentalities and operative for moving the latter to different positions defined by different respective

position coordinates by receiving the motion generated by the motion-generating means and transmitting such motion to the stitch forming instrumentalities; positioning means connected to the motion-generating means and to the transmission means and operative in synchronism with main shaft rotation for performing motion in a second path of motion which is parallel to said first path of motion and in so doing moving through a plurality of different position-coordinate settings which establish the different position coordinates for the stitch forming instrumentalities; electrically activatable and releasable locking means for locking the positioning means in different ones of said position-coordinate settings; and pattern-selecting means connected to the locking means and operative in synchronism with main shaft rotation for selecting the position-coordinate settings in which the positioning means is to be locked and causing the locking means to lock the positioning means in such settings.



4,112,859

AUXILIARY SEWING MACHINE SUPPORT TABLE FOR USE WITH A SEWING MACHINE TABLE

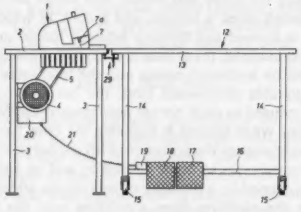
Erich Willenbacher, Rheinstetten, Germany, assignor to Pfaff Industriemaschinen GmbH, Germany

Filed Oct. 14, 1977, Ser. No. 842,354

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 7634272[U]

Int. Cl.[2] D05B *75/00*

U.S. Cl. 112—217.1 **8 Claims**



1. An auxiliary support table for use with a sewing machine table with a sewing machine which has a reciprocating needle, and which has a table top for supporting a part of the workpiece with a sewing table edge extending transversely of the material feed direction to the needle and also having a first portion of an engagement rail trackway extending along the edge, comprising an auxiliary table having an edge extending substantially parallel to the sewing table edge and having a complementary second portion of the engagement rail and trackway which is engageable with the first portion of the engagement rail and trackway, said auxiliary table being shiftable in the direction transverse to the feed direction relative to the sewing machine table with said second portion in engagement with the first portion on the sewing machine support table.

4,112,860

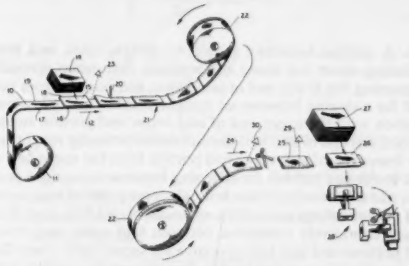
METHOD OF FABRICATING SHIRT CUFFS

Gordon H. Ellington; William O. Mitchell, and Don E. Estapa, all of Vidalia, Ga., assignors to Oxford Industries, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 521,297, Nov. 6, 1974, Pat. No. 3,901,173. This application Feb. 11, 1975, Ser. No. 548,968

Int. Cl.[2] D05B *1/00*

U.S. Cl. 112—262 **14 Claims**



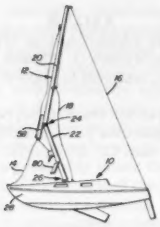
1. A process of forming shirt cuffs or the like comprising moving a continuous web of lining material or the like along a path through a sewing machine at a first work station, placing panels of cuff material on the web of lining material spaced along the length of the web of lining material with an edge portion of the panels of cuff material overlying an edge of the lining material before the web of lining material is moved through the sewing machine and moving the panels of cuff material with the continuous web of lining material toward the sewing machine, detecting the space between adjacent ones of the panels of cuff material on the web, terminating the movement of the panels of cuff material and the continuous web of lining material toward the sewing machine when the spacing between adjacent ones of the panels of cuff material is not within a predetermined range of distances, folding the overlying edge portion of each of the panels of cuff material about the edge of the web of lining material as the web of lining material and panels of cuff material move toward the sewing machine, sewing through the folds of the panels of cuff material and the web of lining material to form a connected series of partially completed cuff assemblies, accumulating a supply of the connected series of partially completed cuff assemblies from the sewing machine, transferring the accumulated supply of the connected series of partially completed cuff assemblies to a second work station, moving the connected series of partially completed cuff assemblies along its length from its accumulated supply to a fabric cutter, stopping the movement of the connected series of partially completed cuff assemblies in response to the movement of a leading panel of cuff material moving past a predetermined position and cutting the lining material behind the leading panel to separate the leading partially completed cuff assembly from the rest of the series of partially completed cuff assemblies, removing the separated partially completed cuff assembly from the series of partially completed cuff assemblies, and beginning the movement of the rest of the connected series of cuff assemblies toward the fabric cutter in response to the removal of the separated partially completed cuff assembly from the series of partially completed cuff assemblies.

4,112,861

MAST STEPPING AND UNSTEPPING STRUCTURE

Barry R. Lewis, 1005 Orange Ave., Sarasota, Fla. 33577

Filed Sep. 30, 1977, Ser. No. 839,105
Int. Cl.[2] B63B *15/00*
U.S. Cl. 114—91 **10 Claims**



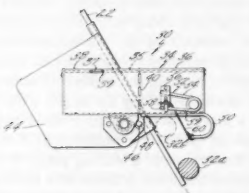
1. A sailboat including a hull, an upright mast, said mast including upper and lower end portions, first means pivotally supporting the lower end of said lower end portion from said hull for swinging between an upright position and a lowered position with the upper end of said lower end portion swung toward one end of said hull, second means pivotally supporting the lower end of said upper end portion from the upper end of said lower end portion for swinging between an upright position and a lowered position with the upper end of said upper end portion swung toward the other end of said hull, amd third means operatively connected between said upper and lower end portions and said hull operative for sequentially controllably lower said lower end portion from its upright position to its lowered position while maintaining said upper end portion upright and thereafter controllably lower said upper end portion from its upright position to its lowered position and for sequentially controllably raising said upper end portion from its lowered position to an upright position and thereafter controllably raise said lower end portion from its lowered position to its upright position while maintaining said upper end portion upright.

4,112,862

APPARATUS AND MEANS FOR PERMANENTLY MARKING A BUOYANT MINE WHICH HAS BEEN SEVERED FROM ITS MOORING WIRE DURING MINE SWEEPING OPERATIONS

William Huly, Stratford, and Rudolph G. Brouillette, Milford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 11, 1971, Ser. No. 154,242
Int. Cl.[2] B63B *9/00, 51/00, 51/02, 21/60*
U.S. Cl. 114—221 R **14 Claims**



1. Apparatus for marking a buoyant mine which has been severed from its mooring wire during mine sweeping operations including:

(A) multi-piece container mechanism,

(B) means to pivotally connect said container mechanism to the sweep wire of mine sweeping gear so as to be pivotable from a first position wherein said container mechanism will intercept a mine mooring wire to a second position by the force of the sweep wire passing along the mooring wire wherein said container is attached to the mine mooring wire,

(C) hook means operatively connected to said container means and positioned to receive the mine mooring wire therein as said container means moves from said first to said second positions,

(D) means to lock the mooring wire in said hook so that as the sweep wire continues to pass along the mooring wire, said multi-piece container mechanism will separate with at lease one portion thereof connected to said hook,

(E) means to sever the mooring wire at a location therealong on the opposite side of said hook from the mine to thereby permit the mine to float to the surface of the water carrying said hook and said portion of the container connected thereto therewith, and

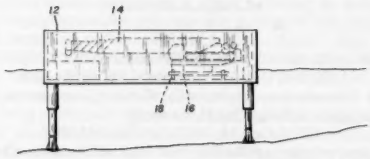
(F) marker means positioned in said container mechanism and connected to said portion thereof which is attached to the hook to thereby mark the buoyant mine and its wire so severed.

4,112,863

BARGE-SUPPORTED CRANE WITH HYDRAULICALLY ACTUATED RAM CORNER LIFT MEANS

Christian E. Nelson, 216 Brookvale Rd., Kinnelon, Smoke Rise, N.J. 07405

Filed Aug. 31, 1977, Ser. No. 829,450
Int. Cl.[2] B63B *35/44*
U.S. Cl. 114—264 **15 Claims**



1. A barge adapted for carrying a crane within the hold portion thereof and in the presence of inert gas, the crane in a raised condition above the deck of the barge adapted to conventionally lift loads and rotate, this barge including: (a) a barge having sides, a bottom and a deck in which an access opening is formed and through which a folded crane may be raised and lowered; (b) at least four corner rams carried by the barge and by hydraulic means and the like, these rams selectively movable downward from the barge to carry a foot portion secured to each corner post toward the bottom of the harbor and when bottom is available the rams having a travel sufficient to engage the bottom and lift the barge to a condition above bouyancy; (c) a crane carried by and on a platform, this platform carried by a plurality of jack means which is actuated to move the platform from a position near the floor of the barge whereat the crane is collapsed and is placed in a stored condition to a position near the deck of the barge so that the crane may be elevated and put to use; (d) means for supporting the crane platform in its lifted condition so as to transfer any and all loads of the crane from said platform to the side walls of the barge as and when the jack means by which the crane platform is lifted is relaxed so that the load of and carried by the crane and the platform is supported by the side walls of the barge; (e) hatch cover means for selectively covering and closing the access opening in the deck when the crane is lowered to a stored condition, this cover means adapted to seal the hold to provide a substantially gas-tight condition, and (f) means feeding a sufficient amount of inert gas into said sealed hold to provide inhibiting protection of the crane and mecha-

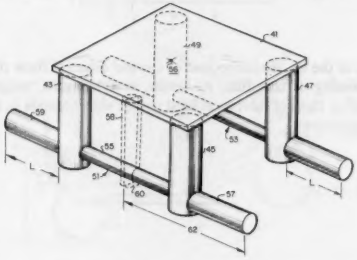
nism from spray, salt air and like factors during transport and storage.

4,112,864

HEAVE STABILIZATION OF SEMI-SUBMERSIBLE PLATFORMS

Gunnar B. Bergman, Montecito, Calif., assignor to Seatek Corporation, Santa Barbara, Calif.

Filed Oct. 8, 1976, Ser. No. 731,007
Int. Cl.[2] B63B *21/52*
U.S. Cl. 114—265 **2 Claims**



1. A semi-submersible floating structure comprising:
deck means;
four columns attached to and extending below said deck means near the extremes thereof for submersion in water to provide buoyant supporting force for the structure, each of the columns having an effective center of gravity of displacement;
pontoon means including a first pontoon attached to a first pair of said columns near the lower ends thereof that are adapted to be submerged and a second pontoon attached to a second pair of columns near the lower ends thereof that are adapted to be submerged, said pontoon means having upper horizontal surface projections which are positioned to remain submerged and having portions which extend longitudinally from the associated column with greater cross-sectional area than the portions thereof between columns.

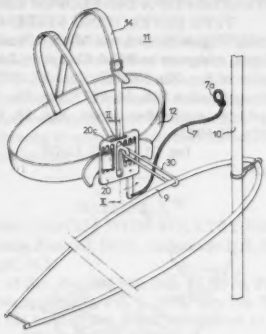
4,112,865

NAVIGATION HARNESSES

Patrick Carn, Route de Benodet, 29000 Quimper, France

Filed Mar. 22, 1977, Ser. No. 780,073
Claims priority, application France, Mar. 23, 1976, 76 08298; Dec. 13, 1976, 76 37521
Int. Cl.[2] B63B *9/08*
U.S. Cl. 114—270 **10 Claims**

1. Improved traction harness, particularly for navigation, and particularly for a sail surfboard type craft, the harness comprising a chest bolt of adjustable length with shoulder straps adjustable to the size of the user, the belt being provided on the belly side with a rigid plate having an attachment point for a connecting element releaseable by the user, the connecting element having one extremity adapted to be attached to said point and another extremity attached to a part of the craft, and a rip cord adapted to be connected to a body extremity of the user, the improved harness being characterized in that
the attachment point to the plate for the releaseable connecting element is formed by an open hook having an operating shank and a retaining portion for the connecting element, the hook being positioned in a vertical slot provided in the plate in such manner that the retaining portion of the hook which receives the connecting element is oriented to protrude from the outer face of the plate,
the said hook being pivotally attached through the vertical slot in the plate, so as to be capable of assuming either of two distinct positions, a hooking-on position for the connecting element in which position the retaining portion and the operating shank of the said hook are approximately parallel to the plane of the plate, and a release position for the said connecting element in which position the retaining portion and the operating shank of the said hook are approximately perpendicular to the plane of the plate,
the said rip cord being coupled to the hook shank so that simple pulling on the cord by the user causes the hook to assume the said release position, thereby freeing the connecting element.

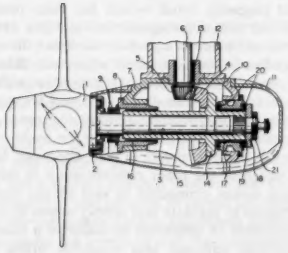


4,112,866

PROPELLER MECHANISM HAVING REMOVABLE PROPELLER SHAFT

Anders Marius Liaaen, Alesund, Norway, assignor to A.M. Liaaen A/S, Alesund, Norway

Filed Apr. 28, 1977, Ser. No. 791,697
Int. Cl.[2] B63H *1/14*
U.S. Cl. 115—34 R **2 Claims**



1. A propeller mechanism, comprising a casing, a propeller shaft disposed in said casing, means for rotating said propeller shaft including a drive shaft disposed at an angle to said propeller shaft and intermeshed bevel gears, one of said gears being coaxially disposed on said drive shaft, a sleeve member surrounding said propeller shaft, the other of said gears being mounted on said sleeve member and being coaxially disposed relative to said propeller shaft, bearing means in said casing in engagement with said sleeve member for supporting said other bevel gear in an intermeshed position with said one bevel gear, said propeller shaft thereby being indirectly supported by said bearing means, and means for detachably securing said propeller shaft within said sleeve member for preventing rotational movement of said propeller shaft and said sleeve member relative to one another but permitting axial withdrawal of said

propeller shaft from within said sleeve member while maintaining said intermeshed position of said gears.

4,112,867

APPARATUS FOR CONTROLLING THE TONER CONCENTRATION OF A DEVELOPER USED IN A DRY TYPE DEVELOPING SYSTEM

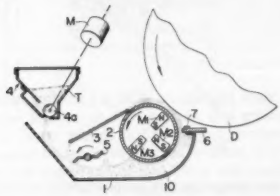
Koichi Suzuki; Shigeru Suzuki, and Minoru Suzuki, all of Yokohama, Japan, assignors to Ricoh Company, Ltd., Japan

Continuation of Ser. No. 587,660, Jun. 17, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,732

Claims priority, application Japan, Jun. 18, 1974, 49-69335; Jun. 19, 1974, 49-69854

Int. Cl.[2] G03G *15/09*

U.S. Cl. 118—7 **5 Claims**



1. An apparatus for controlling the toner concentration of a dry toner in a copying device using a drum having an electrostatic latent image thereon comprising; a dry developer container, a dry developer in said container including a magnetic carrier and a non-magnetic toner, magnetic field producing means for picking up developer with toner from the container and establishing a stationary magnetic field in respect to said container, a rotatable sleeve of non-magnetic material arranged over said stationary magnetic field spaced from the drum and being rotatable to pick up a portion of the toner and carrier supply so as to form a magnetic brush on its surface to be brought into contract with the electrostatic latent image on the drum, a doctor blade having an edge disposed in spaced relationship to said sleeve and contacting and deflecting a portion of the thickness of said magnetic brush so as to retain a remaining magnetic brush of a lesser predetermined thickness and to shape said magnetic brush which has been retained on the surface of said sleeve, a magnetic leakage flux detector means disposed on said blade in a position to detect the magnitude of the leakage flux to the atmosphere adjacent said brush immediately before said brush is brought into contact with the electrostatic latent image on the drum with said leakage flux being generated by said magnetic field producing means, said leakage flux magnitude being proportional to the toner concentration in said brush, supply means in said container for supplying toner to replenish the toner concentration in said developer, and control means connected to said supply means and said detector means to regulate said supply means to suppply toner to said container in quantities to maintain a selected leakage flux magnitude adjacent said magnetic brush immediately before said brush comes into contact with the latent image on the drum.

4,112,868

SOLDERING APPARATUS

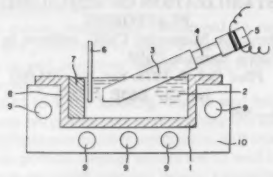
Koji Nomaki, and Yoshihito Saoyama, both of Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Division of Ser. No. 689,527, May 24, 1976, Pat. No. 4,042,725. This application Apr. 11, 1977, Ser. No. 786,193

Int. Cl.[2] B05C *3/05*

U.S. Cl. 118—429 **3 Claims**

1. In an apparatus for providing a solder layer on a surface of a soldering material by dipping the soldering material in a bath of molten solder while applying ultrasonic vibration to the molten solder bath, the improvement which comprises a vessel for the bath of molten solder, a tip for imparting ultrasonic vibration to the bath of molten solder in the bath, and a dummy block for concentrating the ultrasonic vibration between the tip for imparting the ultrasonic vibration and a side wall of the vessel, wherein the dummy block concentrator and at least



part of the tip are composed of a metal selected from the group consisting of tantalum, niobrium, molybdenum, tungsten and an alloy thereof having at least one of those metals as the main component.

4,112,869

APPARATUS FOR FORMING A POWDER LAYER ON THE SURFACE OF A METALLIC SQUEEZE-OUT TUBE

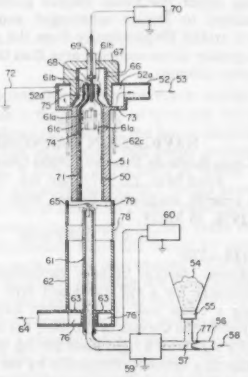
Tsutomu Itoh, Tokyo; Nobuo Furuya, and Kenji Ohuchi, both of Chiba, all of Japan, assignors to Onoda Cement Co., Ltd., Onoda, Japan

Filed Jan. 26, 1977, Ser. No. 762,504

Claims priority, application Japan, Feb. 3, 1976, 51-10005; Mar. 8, 1976, 51-24867

Int. Cl.[2] B05B *5/02*

U.S. Cl. 118—623 **16 Claims**



1. An apparatus for forming a powder layer on a surface of a metallic squeeze-tube having a transition shoulder portion and a neck portion comprising: an upright cylindrical masking holder; a charged particle feeder pipe mounted for vertical movement within and spaced from the inner surface of the masking holder to form a space gap therebetween; an annular electrode disposed above the masking holder opposite to and separated from the outer surface of the neck and the transition shoulder portions of the squeeze-tube, one source of high voltage DC connected to the feeder pipe, said squeeze-tube being connected to ground, and a source of high voltage DC connected to the annular electrode.

4,112,870
APPARATUS FOR DEVELOPING ELECTROSTATIC CHARGE IMAGES

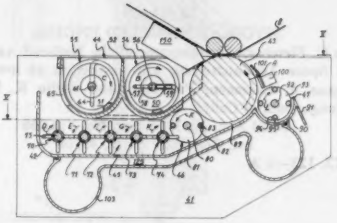
Piet M. J. Extra, Venlo-W.; Lambertus R. J. M. Smeets, Swalmen; Adrianus W. M. Van Bavel, Venlo-W.; Jacobus J. Van Lieshout, Grubbenvorst, and Albert T. Deckers, Maasbree, all of Netherlands, assignors to Océ-van der Grinten N.V., Venlo, Netherlands

Filed Apr. 26, 1977, Ser. No. 791,158

Claims priority, application Netherlands, Apr. 26, 1976, 7604400

Int. Cl.[2] G03G *15/08*

U.S. Cl. 118—657 **11 Claims**



1. In an apparatus for developing electrostatic charge images on a moving support, including a reservoir for holding a developing powder composed of toner particles and magnetizable carrier particles and a rotating magnetic roller for transporting powder from the reservoir through a developing zone wherein the support moves substantially tangentially over the magnetic roller, means at the side of said roller where its surface moves toward said zone for supplying developing powder to said zone at a rate greater than the rate of transport of powder through said zone by said roller, said means including a partition forming with part of the surface of said roller a passage narrowing in the direction toward said zone and means for propelling powder from a part of the reservoir into the wider end of said passage.

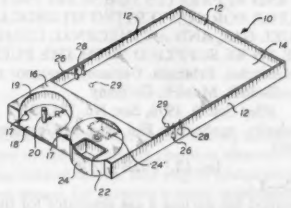
4,112,871
BIRD CAGE FEEDER

Philip Newman, New Rochelle, N.Y., assignor to New Rochelle Manufacturing Co., Inc., New Rochelle, N.Y.

Filed Apr. 14, 1977, Ser. No. 787,335

Int. Cl.[2] A01K *39/00*

U.S. Cl. 119—18 **10 Claims**



1. A bird feeder assembly of the type arranged to be mounted in the lower portion of a bird cage, said feeder assembly comprising:

a tray member arranged to be removably slidably mounted in said bird cage and having a recessed region located at one end thereof, the recessed region extending within the bird cage when said tray member is placed therein;

at least one container means for containing a supply of bird food;

at least one feeding member shaped to be partially disposed within said recessed region and to be rotatably movable therein, said feeding member having a portion thereof shaped to accommodate said container means, the container means being rotatable with said feeding member to a first position outisde of the bird cage, and a second position inside of the bird cage, when said tray member is inside the cage; and

locking means operative to engage said feeding member so that the member becomes locked in a selected one of said first and second positions, said locking means including at least one locating tab disposed in the recessed region of the tray, said feeding member having at least one corresponding opening to accommodate said tab when at one of said first and second positions.

4,112,872
POULTRY CAGE SYSTEM WITH POULTRY REMOVAL

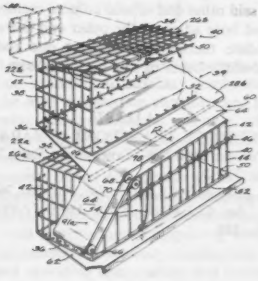
Robert L. Van Huis, Zeeland, Mich., assignor to U.S. Industries, Inc., New York, N.Y.

Continuation of Ser. No. 504,968, Sep. 12, 1974, Pat. No. 4,008,690. This application Jul. 2, 1976, Ser. No. 702,339

The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.

Int. Cl.[2] A01K *29/00*

U.S. Cl. 119—22 **2 Claims**



1. A poultry cage system comprising, in combination: a plurality of poultry cages arranged in a row, each of said cages having a generally horizontal bottom panel and means defining an access opening extending in a vertical plane through which poultry confined therein can be removed, each of said cages including front panel means movable selectively between a first position relative said opening wherein said front panel means covers said opening to prevent movement of poultry therethrough and a second position wherein said front panel means is removed from said opening to permit discharge therethrough, a conveyor means fixably positioned along and extending substantially the length of said row immediately adjacent said openings and in substantially the same horizontal plane as the lower edge of each of said access openings for conveying poultry urged out of said cages through said openings whereby more than one of said cages may be emptied at the same time, and enclosure means having an open side facing all of said access openings for preventing premature departure of poultry conveyed on said conveyor means.

4,112,873
ANIMAL CLIMBING STRUCTURE KIT

Robert D. Van Zandt, 611 Kennon St., Middletown, R.I. 02840

Filed Jan. 5, 1977, Ser. No. 756,899

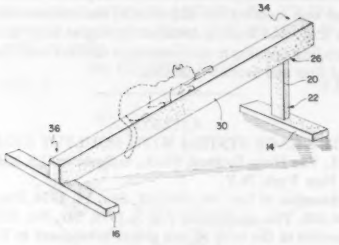
Int. Cl.[2] A01K *29/00*

U.S. Cl. 119—29 **5 Claims**

1. A kit for the assembly of an animal climbing structure comprising:

a pair of base members each having at least one rod-like support element projecting upwardly therefrom;

a column member adapted to be supported at one end thereof atop one of said base members and provided with at least one blind bore in said one end adapted to accomodate therein said at least one rod-like support element of one of said base members and at least one blind bore being provided in the other end of said column member;



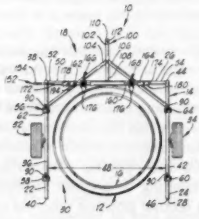
and an elongated beam member covered with a carpet material and having at least one rod-like support element projecting downwardly therefrom adjacent one end thereof adapted to be positioned within the corresponding blind bore in said other end of said column member and at least one blind bore adjacent the other end thereof adapted to accomodate therein said at least one rod-like support element of the other of said base members.

4,112,874

LIVESTOCK TRANSPORT APPARATUS

William J. Forrest, 3400 NW. Expressway, Suite 704, Oklahoma City, Okla. 73112

Filed Feb. 11, 1977, Ser. No. 767,764
Int. Cl.[2] A01K *13/00*; A61D *11/00*
U.S. Cl. 119—158 **10 Claims**



1. A livestock transport apparatus for moving livestock or the like from one location to another location, comprising:

a cage;

a movable frame, having a first side, a second side, a forward end and a rearward end, an opening being formed through the movable frame and a portion of the opening intersecting the rearward end of the movable frame, the cage being movable through the opening formed in the movable rame, a portion of the cage being engageable with a portion of the movable frame in a first position of the cage and the cage being supported via the movable frame in a position elevated a distance generally above the ground surface in the first position of the cage, the movable frame including:

means removably connected to the movable frame having one position for engaging the cage in the first position of the cage and preventing the cage from being moved through the opening in the movable frame;

means for movably supporting the movable frame; and

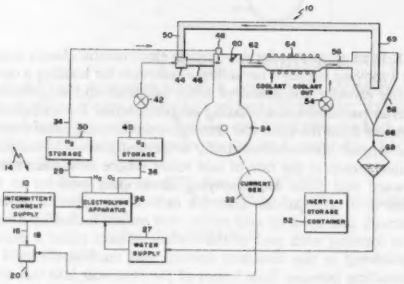
positioning means, having a portion connected to the movable frame and a portion connected to the cage, for positioning the cage in the first position and for raising the cage relative to the first position to a second position wherein the cage is supported a distance above the means for engaging the cage in the first position of the cage, and for lowering the cage to a third position wherein the cage is disposed near the ground surface for loading the livestock into the cage, the means for engaging the cage in the first position of the cage being removable from the movable frame in the second position of the cage.

4,112,875

HYDROGEN-FUELED ENGINE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Eugene A. Laumann, Pasadena, and Rollin K. Reynolds, Tujunga, both of Calif.

Filed Aug. 27, 1976, Ser. No. 718,268
Int. Cl.[2] F02B *75/12*, *43/08*
U.S. Cl. 123—1 A **6 Claims**



1. A method for operating a hydrogen-fueled internal combustion engine comprising:

introducing a mixture of oxygen and a working fluid into the cylinder of said engine;

compressing said mixture; and

injecting hydrogen into the cylinder, to combust the oxygen and hydrogen;

a majority of said working fluid consisting of a noble gas.

4,112,876

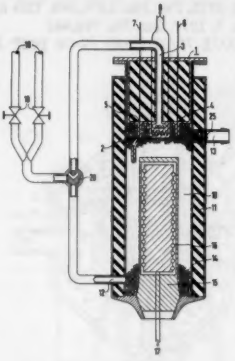
METHOD AND APPARATUS FOR STARTING UP A GAS GENERATOR FOR CONVERTING HYDROCARBONS INTO A FUEL GAS, AND AN INTERNAL COMBUSTION ENGINE TO BE SUPPLIED WITH THE FUEL GAS

Hellmuth Mentschel, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 9, 1976, Ser. No. 721,851
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1975, 2542997
Int. Cl.[2] F02B *43/08*
U.S. Cl. 123—3 **6 Claims**

1. In a method for starting a gas generator for the catalytic conversion of hydrocarbons with an oxygen containing gas to form a fuel gas and for starting an internal combustion engine which is supplied with the fuel gas, comprising the steps of temporarily electrically heating catalytic material disposed in a reaction chamber containing a catalytic charge, conducting a mixture of hydrocarbons and air, which is richer in oxygen than in continuous operation, over the catalytic material; and exothermically reacting the mixture for further heating up the catalytic charge and feeding the fuel gas produced to the internl combustion engine, the improvement comprising:

(a) electrically heating a small part of the volume of the catalytic charge to the start up temperature of the catalyst;
(b) then terminating the electric heating;
(c) cranking the internal combustion engine;
(d) introducing the hydrocarbon/air mixture and reacting it at the heated small part of the volume without flame causing the catalytic charge to be further heated through the spreading of the exothermic reaction; and



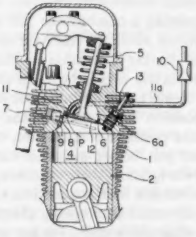
(e) after the remainder of the volume of the catalytic charge is sufficiently heated feeding the hydrocarbons and the oxygen containing gas to the remainder of the volume of the catalytic charge in the generator together along with an oxygen component for the reaction during continuous operation.

4,112,877

INTERNAL COMBUSTION ENGINE

Kenji Goto, and Takao Niwa, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 19, 1976, Ser. No. 733,909
Int. Cl.[2] F02B *19/10, 19/18*
U.S. Cl. 123—32 ST **12 Claims**



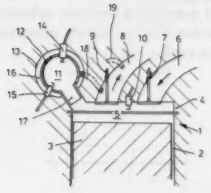
1. An internal combustion engine having means to supply a lean mixture to the combustion chamber after combustion and prior to the exhaust stroke, said engine comprising:
(a) a first means for forming a main combustion chamber, including an intake port through which an air-fuel mixture is supplied to said main combustion chamber, an intake valve for opening and closing said intake port and having one side facing said main combustion chamber,
(b) a second means for forming an auxiliary combustion chamber to hold said lean mixture and located immediately adjacent the intake valve, including passageways communicating said auxiliary combustion chamber only with said main combustion chamber;
(c) a spark plug located remote from said auxiliary combustion chamber and having a spark producing end facing the inside of said main combustion chamber, and a piston; and
(d) means for providing additional air and introducing the additional air into said auxiliary combustion chamber during the suction stroke of said piston.

4,112,878

INTERNAL COMBUSTION ENGINE WITH A MAIN COMBUSTION CHAMBER AND AN AUXILIARY COMBUSTION CHAMBER

Herbert Heitland, and Udo Renger, both of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 22, 1975, Ser. No. 624,924
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1974, 2450305
Int. Cl.[2] F02B *19/10*
U.S. Cl. 123—32 ST **10 Claims**



1. In a spark ignited internal combustion engine including a main combustion chamber, an auxiliary combustion chamber connected to the main combustion chamber, and fuel delivery means for supplying separate partial quantities of fuel to the main combustion chamber and auxiliary combustion chamber; the improvement wherein:
the partial quantity of fuel delivered to the auxiliary combustion chamber is an easily dissociable fuel capable of substantial thermal dissociation at an elevated operating temperature; said improvement comprising means for constantly maintaining the auxiliary combustion chamber at the elevated operating temperature, and means, including the auxiliary combustion chamber, for dissociating the easily dissociable fuel, the main combustion chamber and the auxiliary combustion chamber being in continuous communication with each other so that prior to ignition of a fuel-air mixture in the main combustion chamber a predetermined amount of dissociated fuel mixes with the fuel-air mixture to contribute to exhaust gases low in noxious substances.

4,112,879

PROCESS FOR THE REGULATION OF THE OPTIMUM OPERATIONAL BEHAVIOR OF AN INTERNAL COMBUSTION ENGINE

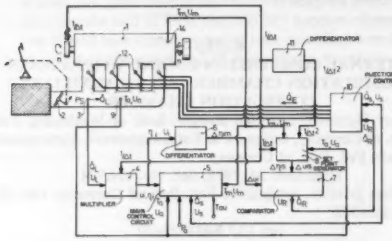
Jürgen Assenheimer, Vaihingen; Valerio Bianchi, Hochdorf; Johannes Brettschneider, Ludwigsburg; Reinhard Latsch, Vaihingen, and Dieter Scherenberg, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 24, 1976, Ser. No. 661,006
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1975, 2507917
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EA **26 Claims**

1. A process for controlling the operation of an internal combustion engine, said engine including a fuel metering system, and an air flow metering system, comprising the steps of:
measuring the volumetric efficiency of said engine, generating first signals related thereto and deriving therefrom a nominal fuel quantity;
differentiating said first signals to obtain second signals related to fluctuations of said volumetric efficiency;

comparing said second signals with set-point values related to permissible magnitudes of said fluctuations;

deriving from said comparison a correction variable; and



altering the prevailing fuel-air ratio of the engine in dependence on said correction variable; whereby said fluctuations of the volumetric efficiency constitute a controlled variable of the engine.

4,112,880

METHOD OF AND MIXTURE CONTROL SYSTEM FOR VARYING THE MIXTURE CONTROL POINT RELATIVE TO A FIXED REFERENCE

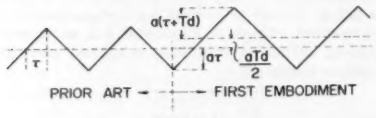
Masaharu Asano, and Shunichi Kadowaki, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 21, 1976, Ser. No. 752,962

Claims priority, application Japan, Dec. 27, 1975, 51-155767; Dec. 27, 1975, 51-155768

Int. Cl.[2] F02B *3/08;* **F02M** *7/12;* **F01N** *3/08*

U.S. Cl. 123—32 EE **10 Claims**



1. A mixture control system for an internal combustion engine including means for supplying mixture of air and fuel thereto in a variable ratio depending upon a signal representative of the concentration of a predetermined constituent gas of the emissions from said engine, and an exhaust gas sensor for generating said signal having a sharp transition in amplitude in response to the presence of said predetermined constitutent gas being above or below a predetermined value corresponding to an air-fuel ratio at or near stoichiometry, comprising:

means for generating a deviation signal representative of the deviation of said transitional signal from a reference representing said predetermined air-fuel ratio, said deviation signal having first and second voltage levels depending upon whether said transitional signal is above or below said predetermined value;

means for extending the duration of said deviation signal at said first voltage level a predetermined time; and

means for integrating said duration-extended deviation signal with time to generate a time integral signal.

4,112,881

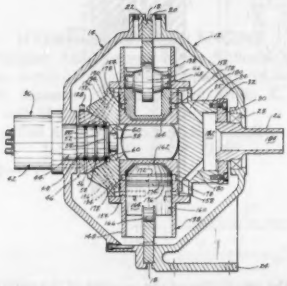
ROTARY INTERNAL COMBUSTION ENGINE EMPLOYING COMPRESSION IGNITION

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Division of Ser. No. 494,409, Aug. 5, 1974, Pat. No. 4,038,953, which is a continuation-in-part of Ser. No. 286,189, Sep. 5, 1972, abandoned, and a continuation-in-part of Ser. No. 301,096, Oct. 26, 1972, Pat. No. 3,857,372, and a continuation-in-part of Ser. No. 378,701, Jul. 12, 1973, Pat. No. 3,874,348. This application Feb. 7, 1977, Ser. No. 766,042

Int. Cl.[2] F02B *3/12, 75/02;* **F02D** *39/04;* **F02P** *23/00*

U.S. Cl. 123—32 B **2 Claims**



1. A compression combustion engine comprising,

a cylinder means having a permanently closed top portion and a cylinder wall portion extending downwardly therefrom,

a piston means having a top portion and being slidably movably mounted in said cylinder means, said top portion being complementary in shape to said closed top portion of said cylinder means,

said piston means being movable between a position of maximum compression and an expanded position, said position of maximum compression comprising that position of said piston when the top portion thereof is closely spaced with respect to the top portion of said cylinder to define a relatively small combustion chamber therebetween,

means for supplying a combustible fuel into said cylinder,

said engine means having a reservoir cavity means for receiving and storing a portion of the combustible fuel therein, said cavity means being in communication with said cavity means being in communication with said cylinder at a position where said piston means closely approaches said position of maximum compression in said cylinder and just before said fuel has been compressed sufficiently for ignition, thereby leaving a remaining quantity of combustible fuel confined in said cylinder within said relatively small combustion chamber above said piston means whereby a slight further displacement of said piston means will suddenly and abruptly increase the pressure of said remaining quantity of fuel to cause combustion thereof throughout said relatively small combustion chamber and substantially across the entire area of the top portion of said piston means,

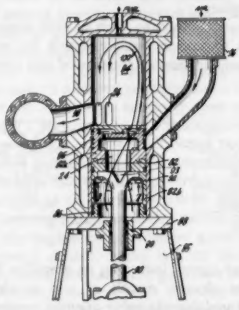
said means for sealing said reservoir cavity means from said relatively small combustion chamber in said cylinder means as said piston means approaches its position of maximum compression whereby the combustion mixture in said cavity means will not be ignited until after combustion of said remaining quantity of combustible fuel has occurred and said seal means on said piston means has opened said cavity means as said piston means moves from its position of maximum compression towards its expanded position.

4,112,882

TWO-CYCLE ENGINE AND PISTON

Jan Henryk Tews, 173 Bedford Ave., Brooklyn, N.Y. 11211

Filed Jun. 26, 1975, Ser. No. 590,573
Int. Cl.[2] F01L *11/00*
U.S. Cl. 123—47 A 20 Claims



1. A piston assembly for use in an internal combustion two-cycle engine which has an exhaust port and an intake port, comprising:

a piston having a top surface and sidewalls depending therefrom to form a generally open hollow cavity therein, said piston having a plurality of relatively small, generally spaced charging passages formed in said top surface in a generally outer circular circumferential zone thereof, to provide communication with said hollow cavity;

means formed in said pistion for pivotally connecting a piston rod thereto;

a piston head adapted for attachment to said top surface by a generally central truck formed on its bottom to provide a dispensing space between said piston head and said top surface of said piston, and rib members formed on the bottom of said piston head extending downwardly for spaced relation with said top surface, said piston head being provided with a plurality of dispensing ports along its generally outer peripheral top surface with a solid sector formed on said peripheral top surface between two adjacent dispensing ports to separate said adjacent ports a distance at least equal to the width of the exhaust port of the engine in which said piston is intended for use;

means for attaching said trunk of said piston head to said top surface of said piston; and

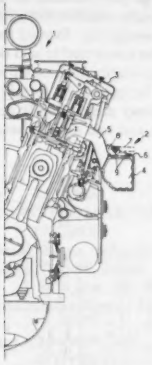
a generally circular pressure sensitive valve comprising a substantially thin donut-shaped valve section for controlling all of said passages, said valve being formed with at least two hinge members adapted to be received between said trunk and said top surface of said piston for flexibly affixing said valve section to the top surface of said piston, such that said valve is substantially sensitive to pressure variations, rising until restricted by the bottoms of said rib members to open said charging passages when pressure from below slightly exceeds pressure from above and to close said passages when pressure from above slightly exceeds pressure from below.

4,112,883

INTERNAL COMBUSTION ENGINE FIT-UP DEVICE

Jean-Claude Bouquet, Pantin, France, assignor to Societe d'Etudes de Machines Thermiques, Saint-Denis, France

Continuation of Ser. No. 639,923, Dec. 11, 1975, abandoned, which is a continuation of Ser. No. 461,889, Apr. 18, 1974, abandoned. This application May 11, 1977, Ser. No. 795,911
Claims priority, application France, Aug. 13, 1973, 73 29568
Int. Cl.[2] F02B *75/18*
U.S. Cl. 123—52 M 7 Claims



1. An internal combustion engine fit-up device for large sized Diesel engines provided with intake and exhaust valve means for controlling the intake of air and the exhaust of the combustion gases respectively, and installable in locations of vehicles wherein the available space in said locations is very small, comprising a Diesel engine provided with said intake and exhaust valve means, intake manifolds for said engine, associated cylinder heads and engine pipes requisite for engine operation, said intake and said exhaust valve means being located in said cylinder heads, wherein each said intake manifold is arranged at a level lower than that of its associated cylinder head, each said manifold presenting a top surface that is approximately plane and horizontal, supporting means located on said top surface, and a walkway mounted by said means above each said intake manifold and providing a space between said surface of each said manifold and the under face of said walkway, and wherein said engine pipes are located in said space between said walkway and said intake manifold, so as to eliminate obstruction of said cylinder heads and provide free access to said cylinder heads and other engine parts located above said walkway.

4,112,884

VALVE LIFTER FOR INTERNAL COMBUSTION ENGINE

Akira Tominaga, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 2, 1976, Ser. No. 702,291
Claims priority, application Japan, Mar. 12, 1976, 51-26047
Int. Cl.[2] F01L *1/14*
U.S. Cl. 123—90.48 7 Claims

1. A valve lifter adapted for actuating a valve positioned in either intake or exhaust port formed in a cylinder of an internal combustion engine comprising:

a hollow sleeve fixedly mounted in a head portion of said engine cylinder, the sleeve having therein a cylindrical inner wall;

a round lifter element slidably fitted in said hollow sleeve;

a push rod connected to said round lifter element;

a rocker arm co-operable with said push rod for opening the valve;

a plunger arranged to be movable into and away from said

hollow sleeve and to be also angularly movable about the axis thereof, said plunger including a first and a second cylindrical lands both arranged to be slidable along the cylindrical inner wall of said hollow sleeve, said first and second cylindrical lands defining therebetween an annular space;

a liquid chamber defined between said round lifter element and said first cylindrical land of said plunger;

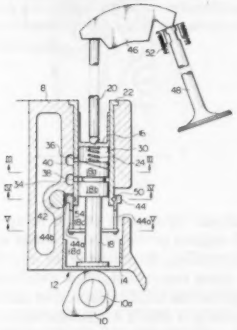
a liquid-introduction port formed in said inner wall of said sleeve and fluidly connectable to said annular space;

a liquid-discharge port formed in said inner wall of said sleeve and fluidly connectable to said liquid chamber;

a liquid-inlet passageway formed in said engine cylinder head so as to be connected to said liquid-introduction port;

a liquid-outlet passageway formed in said engine cylinder head so as to be connected to said liquid-discharge port;

a liquid passageway means fluidly connecting between said annular space and said liquid chamber;



a valve cam driven by said engine for causing the axial movement of said plunger into and away from said hollow sleeve, and;

means for providing said plunger with the angular movement in response to the change in the operation condition of said internal combustion engine, said first land being provided with an end surface for compressing a liquid in said liquid chamber in response to the movement of said plunger into said hollow sleeve, and a circumferential surface for facing and covering said liquid-discharge port in response to the movement of said plunger into said hollow sleeve, said circumferential surface of said first land being formed with a cut defining a spirally extending edge co-operable with said liquid-discharge port so that the time for initiating the compression of the liquid in said liquid chamber by said compression end surface of said first land is varied in response to the angular movement of said plunger.

4,112,885

THROTTLE VALVE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Toshiharu Iwata; Tadashi Hattori; Kouichi Mori, all of Okazaki, and Tomojiro Akiyama, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed May 17, 1976, Ser. No. 688,080

Claims priority, application Japan, May 23, 1975, 50/62408

Int. Cl.[2] F02P *9/00*; F02D *1/04*

U.S. Cl. 123—98 **10 Claims**

1. A throttle valve control system for an internal combustion engine comprising:

accelerator means movably mounted on a vehicle and operable as required;

accelerator sensing means connected to said accelerator means for generating an electric signal corresponding to the amount of movement of said accelerator means;

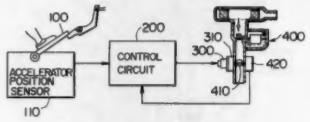
a throttle valve disposed in an intake passage of said internal combustion engine for controlling the area of opening of said intake passage;

throttle valve opening sensing means connected to said throttle valve for generating an electrical signal corresponding to the opening of said throttle valve;

a reversible motor operatively connected to said throttle valve for operating said throttle valve;

engine condition sensing means provided in said internal combustion engine for detecting the operating conditions of said engine;

a control circuit joined to each of said sensing means and connected to said reversible motor for controlling the direction and amount of rotation of said reversible motor,



said control circuit including an amplifier for amplifying one of the electric signals of said accelerator sensing means and said throttle valve opening sensing means by an amplification factor which is changed in accordance with said detected operating conditions, a comparison circuit for comparing the amplified signal from said amplifier and the other of said two electric signals as to relative magnitude so as to generate a comparison signal, and a driving circuit responsive to said comparison signal for determining the direction of rotation of said reversible motor, whereby the opening of said throttle valve is maintained at a value corresponding to the operating conditions of said engine and the amount of movement of said accelerator means; and

a power source for energizing said reversible motor and said control circuit.

4,112,886

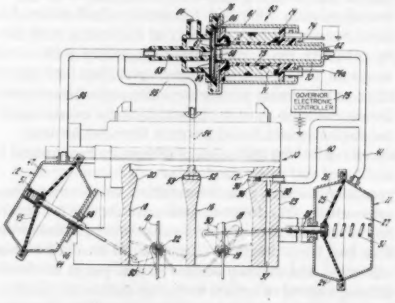
ENGINE SPEED GOVERNOR

Roland G. Kibler, Flushing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1976, Ser. No. 746,394

Int. Cl.[2] F02D *11/08*

U.S. Cl. 123—103 R **2 Claims**



1. An engine speed governor for an internal combustion engine having a carburetor wherein the carburetor includes a primary intake passage having a venturi and a primary throttle valve for controlling the flow of fluid therethrough, a secondary intake passage having a venturi and a secondary throttle

valve therein, said engine speed governor including a vacuum actuated first governor actuator operatively connected to said primary throttle valve, governor spring means operatively connected to said primary throttle valve to bias said primary throttle valve in a valve opening direction, a first conduit, including orifice passage means, connecting said first governor actuator to said primary intake passage whereby said first governor actuator can be actuated by primary venturi vacuum for closing said primary throttle valve against the biasing action of said governor spring means, a vacuum actuated second governor actuator operatively connected to said secondary throttle valve, a second conduit connecting said secondary governor actuator to at least said primary intake passage whereby said second governor actuator is actuated by primary venturi vacuum to permit normal secondary throttle valve operation, resilient means operatively connected to said secondary throttle valve for normally biasing said secondary throttle valve toward a closed position; and a three-way, solenoid governor valve having a normally open port, a normally closed port and a port open to the atmosphere, said solenoid governor valve having said normally open port connected to said first conduit and said normally closed port connected to said second conduit, said solenoid governor valve being operatively connectable to an electrical power source through an engine speed sensing means whereby during operation of the engine when the engine speed is below governed speed, said solenoid governor control valve will be de-energized thus allowing air to bleed into said first governor actuator keeping it in a non-governing position while allowing vacuum to build up in said second governor actuator to permit normal operation of said secondary throttle valve; whereby when with increasing engine speed the engine operates close to governed speed said solenoid valve can be duty cycled so as to restrict air bleed to said first governor actuator and to allow restricted air bleed to flow to said secondary governor actuator; and, whereby when the engine operates above a governed speed, said solenoid valve can be continuously energized so as to shut off the flow of bleed air to said first governor actuator thereby allowing primary venturi vacuum to effect operation of said first governor actuator to close said primary throttle valve while allowing bleed air to flow to said second governor actuator whereby to permit said resilient means to close said secondary throttle valve.

4,112,887
AUTOMATIC SPARK TIMING DEVICE

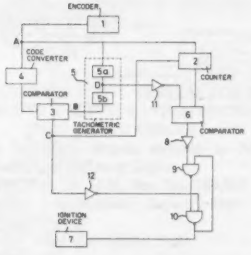
Louis Jean Château, Rosny sur Bois, France, assignor to Ducellier et Co., Paris, France

Filed Jul. 28, 1975, Ser. No. 599,338

Claims priority, application France, Jul. 31, 1974, 74 26581; Dec. 27, 1974, 74 42950

Int. Cl.[2] F02P 5/04

U.S. Cl. 123—117 D **2 Claims**



1. An internal combustion engine ignition system comprising an ignition coil periodically supplied with current, a spark circuit connected to the coil so that a spark is generated thereby each time the current in the ignition coil is interrupted, an angular position detecting means providing a digital output varying in accordance with displacement of the engine shaft beyond a datum position, a tachometric generator producing a digital output representing the engine shaft speed, ignition control means responsive to the digital signals from the angular position detecting means and the tachometric generator determining the instant of cessation of current flow in said coil in accordance with a predetermined ignition advance law, and coil current control means responsive to the digital signal from the tachometric generator and to the output of said ignition control means for determining when current flow in the coil is recommenced following each spark.

4,112,888
IGNITION TIMING CONTROLLER FOR A GASOLINE ENGINE

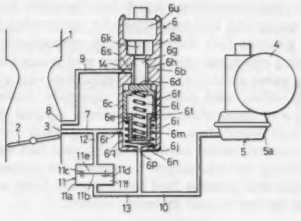
Keiichi Okabayashi, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 28, 1976, Ser. No. 681,040

Claims priority, application Japan, Dec. 26, 1975, 50-176951[U]

Int. Cl.[2] F02P 5/14

U.S. Cl. 123—117 A **3 Claims**



1. An ignition timing controller for a gasoline engine comprising:

a thermosensor having a first port connected through a first passage to an advancer port opening to a carburetor, said advancer port opening being located at a portion above the upper edge of a throttle valve when in closed position, a second port connected through a second passage to an advance control port opening to said carburetor and located above said advancer port and a third port connected through a third passage to a vacuum advancer of a distributor, said first port being adapted for communication with said third port through said thermosensor over a first engine temperature range no higher than a predetermined value, and with said second port through said thermosensor over a second engine temperature range higher than said predetermined value, said communication of said first and second ports being cut off over said first temperature range and said communication of said first and third ports being cut off over said second temperature range;

a negative pressure delay valve, connected to said first passage and said third passage, for delaying transmission of negative pressure from said carburetor to said vacuum advancer when negative pressure is increased from a predetermined level and for transmitting negative pressure from said carburetor to said vacuum advancer without delay when negative pressure is decreased; and

a throat in said second passage.

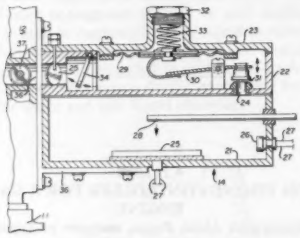
4,112,889
FUEL SYSTEM AND VAPORIZER FOR INTERNAL COMBUSTION ENGINES

Webster B. Harpman, Poland, Ohio, assignor to Energy Research Inc., Murrysville, Pa.

Continuation of Ser. No. 535,110, Dec. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 400,413, Sep. 24, 1973, Pat. No. 3,968,775. This application Nov. 26, 1976, Ser. No. 745,167

Int. Cl.[2] F02D *19/00*

U.S. Cl. 123—25 B **9 Claims**



1. An improved fuel system for an internal combustion engine having an inlet manifold; a metering valve in communication therewith arranged to control air flowing therethrough and to control and introduce gaseous fuel into said air and direct said air and gaseous fuel to said inlet manifold, a water vaporizer and a supply of water therefor and a liquid fuel vaporizer and a supply of liquid fuel therefor, heating means for said water and fuel vaporizers for generating water vapor and hot gaseous fuel under pressure respectively and means establishing communication between said water vapor and said metering valve and between said liquid fuel vaporizer and said metering valve, said liquid fuel vaporizer including means responsive to temprature to exclusively control the vaporization of said liquid fuel, a pressure regulator device in said communication means between said liquid fuel vaporizer and said metering valve arranged to control the pressure of and to permit said hot gaseous fuel to flow only from said pressure regulator device to said metering valve.

4,112,890
CONTROLLED IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE TO PROVIDE, SELECTIVELY, ONE OR MORE IGNITION PULSES FOR ANY IGNITION EVENT

Hansjorg Manger, Schwieberdingen; Gerhard Sohner, Remshalden, and Gerd Hohne, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 11, 1977, Ser. No. 776,740

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616693

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 R **17 Claims**

1. Ignition system to provide, selectively, one ignition impulse, or a series of ignition pulses to a spark gap (**20**) in which the one, or the first one of said pulses occurs at a predetermined time after occurrence of a cyclically recurring event,

particularly to provide said pulses to the spark plug of an internal combustion engine (E) with respect to a predetermined angular position of the crankshaft of the engine and having

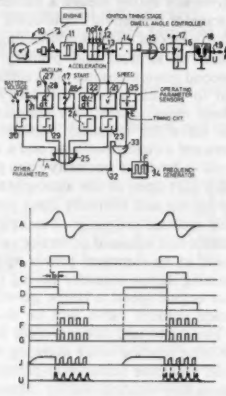
an ignition coil (**18**), and a spark gap (**20**) connected to the secondary of the ignition coil;

means (**10, 11, 12; 10''**) determining the timing of the event;

and a controlled switch (**16**) in series with a source of current (**17**) and the primary of the ignition coil (**18**) to periodically supply current to the coil and generate said ignition pulse by transformer action, and comprising

an ignition pulse control stage (**14**) connected to and controlling operation of the controlled switch (**16**) to command closing of the switch at a predetermined time after occurrence of the preceding event, and in advance of the next subsequent event, and to command generation of said one, or first one of said ignition pulses as determined by the timing of the next subsequent event;

and means (**34; 100, 101**) generating a plurality of ignition pulses connected to said controlled switch (**16**) and con-



trolling said switch to repetitive operation and cause, after occurrence of said event and at a rate which is rapid with respect to the recurrence rate of said events, to provide a pulse train for generation of a train of sparks at said spark gap, the timing of the first one of said ignition pulses being determined by said ignition pulse control stage;

and means (**32; 33, 33', 33''**) selectively controlling application of the plurality of ignition pulses, in excess of said first pulse to said spark gap (**20**).

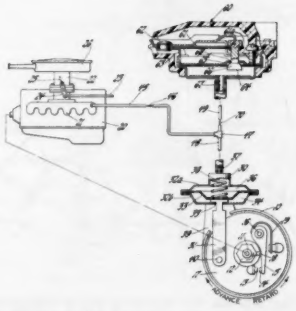
4,112,891
TEMPERATURE COMPENSATED INTERNAL COMBUSTION ENGINE IGNITION SPARK VACUUM ADVANCE SYSTEM

James R. Spaulding, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 21, 1976, Ser. No. 734,532

Int. Cl.[2] F02P *5/12*

U.S. Cl. 123—117 A **4 Claims**



1. A temperature compensated internal combustion engine ignition spark vacuum advance system comprising in combination with an associated internal combustion engine having an

intake air passage: an engine vacuum signal source; an ignition spark initiating mechanism operated by a vacuum responsive device for adjusting ignition spark timing in response to changes of engine vacuum; means for applying said engine vacuum signal to said vacuum responsive device; and means responsive to engine intake air temperature for adjusting the level of said engine vacuum signal as applied to said vacuum responsive device proportionally with changes of engine intake air temperature, said last-named means being arranged to effect said adjustment in a direction toward atmosphere as the temperature of said engine intake air increases and vice versa.

4,112,892

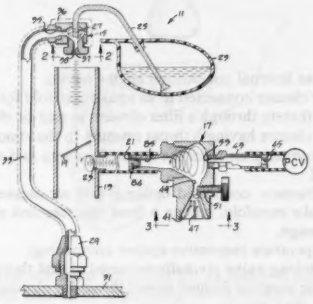
COMBUSTION CONTROL SYSTEM FOR ADDING FLUID ABOVE THE BUTTERFLY VALVE

John E. Lindberg, Berkeley, Calif., assignor to Owen, Wickersham & Erickson, San Francisco, Calif.

Filed May 4, 1977, Ser. No. 793,556

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **13 Claims**



1. A combustion control system for adding a fluid to the air-fuel mixture of the induction system of an internal combustion engine in response to engine need for the added fluid to improve the combustion of the fuel, said system comprising

variable impedance flow control means for producing an impedance to flow through the control means which varies in relationship to the pressure differential across the flow control means and which also varies in relationship to an acceleration of flow through the variable impedance flow control means,

outlet means connecting the outlet of the variable impedance flow control means to the induction system of the engine,

input means for supplying a liquid and engine exhaust gases to the inlet of the variable impedance flow control means, and

wherein the outlet means include an outlet positioned above the butterfly valve of the engine.

4,112,893

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE HAVING HIGH INPUT IMPEDANCE CIRCUIT

Makoto Anzai, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

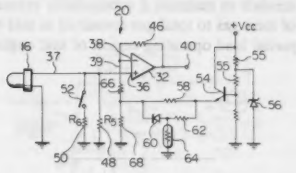
Filed Dec. 13, 1976, Ser. No. 749,909

Claims priority, application Japan, Dec. 25, 1975, 50/174440[U]

Int. Cl.[2] F02M *7/00*

U.S. Cl. 123—119 EC **5 Claims**

1. In a feedback control system for controlling the air-to-fuel ratio of a combustible mixture fed to an internal combustion engine, the system including an electrically controllable air-fuel proportioning device, an exhaust sensor which is installed in the exhaust line of the engine to develop an output voltage representing the concentration of a definite component of the exhaust gas as an indication of an actual air-to-fuel ratio realized in the engine, and a control circuit which provides a control signal to the air-fuel proportioning device based on th magnitude of a deviation of the output voltage the improvement comprising an input circuit, as a prefatory circuit to the control circuit, including an operational amplifier with a noninverting input terminal thereof connected to the output terminal of the exhaust sensor, said input circuit having an input impedance high enough to match with the internal impedance of the exhaust sensor even when said internal impedance rises with a variation in the exhaust gas temperature, two resistors different in resistance, and a switching means for grounding the input line connecting said noninverting input terminal to the output terminal of the exhaust sensor selectively through at least one of said two resistors depending on the exhaust gas temperature.



4,112,894

APPARATUS FOR RECIRCULATING EXHAUST GASES

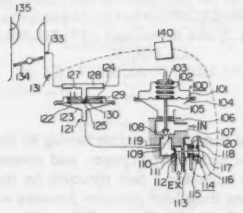
Hidetaka Nohira, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Feb. 2, 1976, Ser. No. 654,176

Claims priority, application Japan, Oct. 3, 1975, 50-118927

Int. Cl.[2] F02M *7/12*

U.S. Cl. 123—119 A **3 Claims**



1. A recirculating exhaust gas control system for maintaining a substantially constant proportion of inert gas to total gas in the cylinders of an operating engine comprising:

an exhaust system connected with said engine;

a fuel and air supply system for said engine containing a throttle valve therein;

conduit means connecting said exhaust system to said supply system to supply recirculated inert gas to said cylinders;

exhaust gas recirculating valve means disposed in said conduit for regulating the flow of said recirculated inert gas therethrough, said valve means including a first pressure responsive valve device biased toward a conduit blocking position and responsive to the negative pressure existing in said supply system upstream of said throttle for unblocking said first conduit by an amount proportional to said upstream negative pressure, a second pressure responsive valve device biased toward a conduit opening position and responsive to the negative pressure existing in said supply system downstream of said throttle for blocking said first conduit by an amount proportional to said downstream negative pressure, and a constant pressure chamber

disposed in said recirculated inert gas path between said first and second valve devices; and,

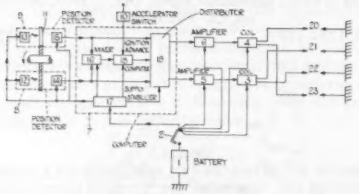
regulator means responsive to the pressure existing in said constant pressure chamber for controlling the operation of said first pressure responsive valve device to maintain a substantially constant pressure in said chamber, said first and second valve devices and regulator means operating to control the flow of said recirculated inert gas through said conduit to maintain a substantially constant proportion of inert gas to total gas contained in said cylinders at any partial load operating region of said engine.

4,112,895

ELECTRONIC DISTRIBUTION AND CONTROL DEVICE FOR THE IGNITION OF INTERNAL COMBUSTION ENGINES, PARTICULARLY FOR MOTOR VEHICLES

Roger Habert, Epinay, sur Seine, France, assignor to Ducellier et Cie, Paris, France

Continuation-in-part of Ser. No. 466,484, May 2, 1974, abandoned. This application Feb. 3, 1976, Ser. No. 654,946
Claims priority, application France, May 10, 1973, 73.16946
Int. Cl.[2] F02P *5/04*
U.S. Cl. 123—117 R **4 Claims**



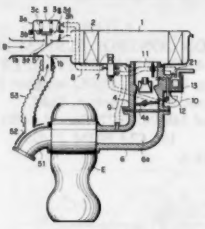
1. An internal combustion engine having an electronic ignition distribution and control system, said system comprising detector means including a part rotatable by the engine and directly detecting fixed limit positions between which ignition must take place for each cylinder of the engine, said detector means generating respectively first and second output signals at said limit positions, a computer including an ignition advance system connected to said detector means to trigger said ignition advance system into operation whenever the first output signal is produced, said ignition advance system including delay determining means sensitive to at least one engine operating parameter to determine delay between triggering of said advance system and production of a spark producing output signal thereby, said advance system also including means for producing a spark producing signal independently of said delay determining means whenever the second output signal occurs before termination of the delay, at least one amplifier connected to said computer for amplifying the spark producing signal, a voltage step-up coil means having a primary connected to said amplifier and a secondary connected to at least one spark plug for producing a spark at said spark plug either after a delay determined by said at least one engine operating parameter following production of the first output signal, or upon production of the second output signal, whichever occurs first.

4,112,896

TEMPERATURE RESPONSIVE DEVICE FOR INTERNAL COMBUSTION ENGINES

Hajime Akado, Anjo; Yoshiro Uchida, Toyota; Akihide Yamaguchi, Kariya; Takao Nonoyama, Toyota; Suminobu Ootsubo, Toyota, and Toshiro Harada, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 27, 1978, Ser. No. 872,776
Claims priority, application Japan, Jan. 27, 1977, 52-8489[U]
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 D **2 Claims**



1. In an internal combustion engine having

an air cleaner connected to an intake manifold for supplying air thereto through a filter element in said air cleaner, said air cleaner having a throat opening to the atmosphere for introducing air from the atmosphere into said air cleaner, and

a carburetor, connected between said air cleaner and said intake manifold, having a float chamber and a slow-port passage,

a temperature responsive system comprising:

a switching valve pivotally mounted in said throat adjacent to an aperture formed in said throat for closing and opening the same;

a negative pressure motor mounted on said throat and having a negative pressure chamber and a movable diaphragm responding the negative pressure applied to said negative pressure chamber, said diaphragm being connected to said switching valve so that said switching valve is actuated to close and open said aperture in response to the movement of said diaphragm;

a conduit connected to said aperture at one end and opening to a portion of an exhaust manifold of said engine so as to introduce warmed air around said exhaust manifold into said air cleaner when said aperture is opened; and

a thermostatic valve mounted in said air cleaner having an inlet connected to said intake manifold and an outlet connected to said negative pressure chamber,

wherein said thermostatic valve comprises:

temperature responding means, exposed to the inside of said air cleaner, having a temperature responding expanding material and a driving lever driven by the expansion of said expanding material, the expansion thereof being responsive to the temperature of the air in said air cleaner;

valve casing means coupled to said temperature responding means and defining therein first and second compartments, said valve casing means having an air vent port for communicating said first compartment with the atmosphere, a first port for communicating said first compartment with said negative pressure chamber of said negative pressure motor, a second port for communicating said first compartment with the intake manifold of said engine, a third port for communicating said second compartment with the float chamber of said carburetor, and a fourth port for communicating said second compartment with the slow-port passage of said carburetor;

a first valve member disposed in said first compartment and operatively coupled to said driving lever of said temperature responding means for closing and opening said air

vent port in accordance with the movement of said driving lever; and

a second valve member disposed in said second compartment and operatively driven by said driving lever for closing and opening said third port in accordance with the movement of said driving lever, the communication between said third and fourth ports being established when said second valve member opens said third port.

4,112,897

ROTATIONAL SPEED GOVERNOR FOR AN INJECTION PUMP IN AIR-COMPRESSING INJECTION INTERNAL COMBUSTION ENGINES

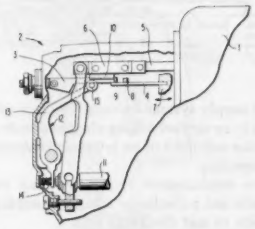
Ernst-Wilhelm Hufendiek, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 22, 1976, Ser. No. 743,980

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1975, 2552991

Int. Cl.² F02M *39/00*; F02D *1/02*; F02N *17/00*

U.S. Cl. 123—139 ST **11 Claims**



1. A rotational speed controller for an injection pump with an abutment means for controlling the injection quantity by interacting with a control rack of the injection pump, which abutment means releases the travel of the control rack in the direction toward a starting quantity, which is increased relative to a post warm-up fuel quantity, during the starting operation of an internal combustion engine, characterized in that an engine temperature-dependent control means is provided which cooperates with said abutment means and which is operable to cancel the release of the increased starting quantity above a predetermined temperature.

4,112,898

INTERNAL COMBUSTION ENGINE WITH CHARCOAL CANISTER

Masatami Takimoto, Toyota, and Koichi Mizutani, Seto, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 7, 1977, Ser. No. 785,671

Claims priority, application Japan, Jan. 13, 1977, 52-1940

Int. Cl.² F02M *33/02*

U.S. Cl. 123—136 **1 Claim**

1. An internal combustion engine comprising: an engine body;

a carburetor for forming a combustible air-fuel mixture, said carburetor being provided with a throttle valve for controlling an amount of said mixture:

an intake system located downstream of said throttle valve, for supplying said air-fuel mixture to said engine body;

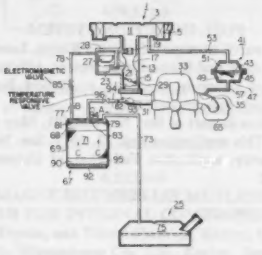
an exhaust system for receiving the resultant exhaust gas from said engine body;

a secondary air introducing system adapted for introducing secondary air into said exhaust system;

an exhaust gas purifying system for oxidizing unburnt toxic components remaining in the exhaust gas together with the secondary air;

a charcoal canister which includes a casing and a charcoal layer arranged in said casing, said casing having on one side thereof a first opening communicating with the atmosphere for introducing purge air into said casing and having on the other side thereof a second opening and a third opening;

a first pipe means which connects the second opening with the engine at a place where the evaporation of fuel takes place for introducing evaporative fuel into the charcoal layer wherein the evaporative fuel is caused to be absorbed by the charcoal layer;



a second pipe means which connects the third opening with the engine intake system said second pipe means having an orifice for producing a controlled amount of said absorbed evaporative fuel into said intake system; and, temperature responsive valve means provided in said second pipe means for preventing the introduction of evaporative fuel into said intake system when the temperatue of said engine is extremely increased.

4,112,899

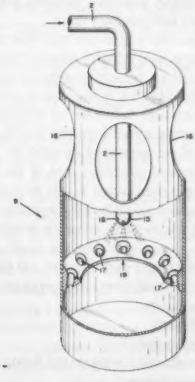
PRESSURIZING FUEL RAM AIR CHARGER

John B. Kramer, Houston, Tex., assignor to Allied Chemical Corporation, Morristown, N.J.

Continuation of Ser. No. 655,196, Feb. 4, 1976, which is a continuation of Ser. No. 162,885, Jul. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 19,950, Mar. 15, 1970, Pat. No. 3,664,315. This application Jan. 7, 1977, Ser. No. 757,803

Int. Cl.² F02M *39/00*; F02B *3/00*

U.S. Cl. 123—139 AW **5 Claims**



1. A method of introducing gasoline liquid into the air intake system of an internal combustion engine which comprises atomizing at least a portion of said liquid to droplets at a point of constriction in air entrainment injection means so as to create a substantially maximum venturi effect at said point of

constriction, entraining separately introduced air with said atomized liquid droplets at the point of constriction, immediately thereafter subjecting the atomized liquid droplets and said air to mixing at and after the point of constriction by passing the same through mixing ports bypassing said point of constriction, further entraining secondarily supplied air as a result of the mixing, and then moving said atomized liquid droplets and air, homogeneously mixed, for introduction into the internal combustion engine.

4,112,900
FUEL INJECTION SYSTEM

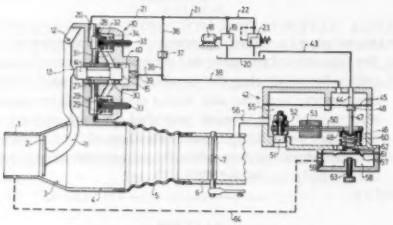
Reinhard Schwartz, Stuttgart; Heinrich Knapp, Leonberg; Klaus Riel, Möglingen, and Klaus-Jürgen Peters, Affalterbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 683,401, May 5, 1976, abandoned. This application Sep. 23, 1977, Ser. No. 836,184

Claims priority, application Fed. Rep. of Germany, May 7, 1975, 2520322

Int. Cl.[2] F02M *7/18*

U.S. Cl. 123—139 AW **5 Claims**



1. A fuel injection system for externally ignited internal combustion engines comprising, in combination:

(a) a suction tube for air intake to the engine;

(b) an air sensor disposed in said suction tube;

(c) an arbitrarily operable butterfly valve disposed in said suction tube in series with said air sensor;

(d) a fuel supply conduit;

(e) a control pressure conduit;

(f) a fuel metering valve connected to said fuel supply conduit and said control pressure conduit for continuously injecting fuel into said suction tube;

(g) a control plunger, serving as the movable member of said fuel metering valve, said control plunger being acted upon on one end by said air sensor, and on an opposite end by a return force provided by liquid under constant but arbitrarily variable pressure delivered by said control pressure conduit, for metering a fuel quantity that is proportionate to the quantity of air measured by said air sensor; and

(h) at least one pressure control valve in the form of a flat seat valve having a membrane as the movable valve part, said pressure control valve being disposed in said control pressure conduit for varying pressure in said control pressure conduit in dependence on at least one operating parameter of the engine and thereby varying the fuel-air ratio at or near full load operations wherein said pressure control valve includes:

(i) a valve membrane;

(ii) a control membrane;

(iii) two pressure chambers separated from one another by said control membrane;

(iv) a pressure conduit connected to a first one of the pressure chambers and to the suction tube downstream of the butterfly valve;

(v) means for communicating a reference pressure to a second one of the pressure chambers;

(vi) a valve spring disposed in the first one of the pressure chambers, said valve spring acting against the valve membrane; and

(vii) a control spring disposed between the valve membrane and the control membrane.

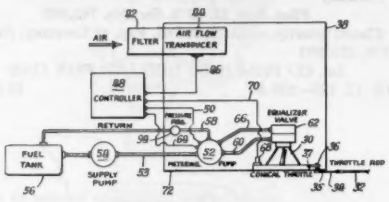
4,112,901
FUEL SYSTEM WITH METERING PUMP FOR INTERNAL COMBUSTION ENGINES

Leonard Lee Chapin, and James Walter Merrick, both of El Paso, Tex., assignors to Autotronic Controls, Corp., El Paso, Tex.

Filed Apr. 1, 1977, Ser. No. 783,610

Int. Cl.[2] F02M *39/00*

U.S. Cl. 123—139 E **20 Claims**



1. A fuel supply system for supplying volatile fuel at a controlled rate to an air-fuel mixing chamber leading to a subatmospheric intake manifold of an internal combustion engine, said system comprising:

a positive displacement rotary metering pump having an inlet side and a discharge side for pumping fuel from said inlet side to said discharge side,

fuel pump means for supplying volatile fuel from a fuel reservoir to said inlet side at a substantial elevated pressure at which said fuel remains liquid passing through said metering pump,

equalizer valve means including a valve body forming a valve chamber with an outlet opening therefrom, a resilient diaphragm dividing said valve chamber into first and second parts with said outlet opening in said first part and mounted in said valve body for movement by pressure differentials between said first and second parts, a valve closure member for closing said outlet opening supported in said valve chamber by said diaphragm for motion therewith, and means biasing said diaphragm to effect closure of said outlet opening by said valve closure member when the pressure in said first part is less than a small differential greater than the pressure in said second part, said small predetermined differential being insufficient to produce any substantial leakage of liquid through said metering pump,

first fluid conduit means connecting said discharge side of said metering pump to said first part of said valve chamber,

second fluid conduit means connecting said inlet side of said metering pump to said second part of said valve chamber,

third fluid conduit means for connecting said outlet opening from said valve chamber to said air-fuel mixing chamber,

a variable speed electrical pump motor coupled to said metering pump for driving said metering pump,

control means for providing an electrical control signal systematically related to a desired rate of fuel supply,

speed measuring means coupled to said metering pump for producing a feedback signal systematically related to metering pump speed, and

circuit means responsive to said control signal and said feedback signal for providing electrical power to said pump motor to drive said motor at a controlled rate whereat said positive displacement metering pump pumps said volatile fuel at substantially the desired rate from said inlet side to said discharge side, whence said fuel flows at

substantially said desired rate through said first conduit means to said first part of said valve chamber wherein it produces pressure relative to that in said second part whereat said valve closure member is positioned relative to said outlet opening for said fuel to flow therethrough at said desired rate to said air-fuel mixing chamber.

4,112,902

HYDRAULIC SPEED CONTROL SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Jose Esteban Torralba, Zaragoza, Spain, assignor to Talleres Diesel, S.A., Zaragoza, Spain

Filed Jun. 7, 1976, Ser. No. 693,495
Claims priority, application Spain, Aug. 9, 1975, 440,157
Int. Cl.[2] F02M *39/00*; F02D *1/06, 1/04*
U.S. Cl. 123—140 FG **5 Claims**

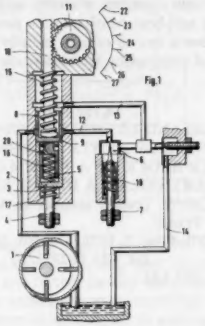


Fig.1

1. A hydraulic speed control for internal combustion engines, comprising a cylinder, a pump, whose pumping rate is proportional to that of the engine whose speed is being controlled, an inlet from said pump to said cylinder, at least two outlets in said cylinder at different levels, a plunger in said cylinder, a control linkage, a spring urging said control linkage against said plunger, means for controlling the amount of fuel supplied to the engine, said control linkage engaging said means for controlling, an accelerator means for controlling the flow from at least one outlet, said plunger being free to move against the force of said spring under the urging of said fluid, the position assumed by said plunger being determined by the fluid pressure from said pump and the position of said accelerator, a chamfer on said plunger said chamfer forming a channel having a variable passage, said variable passage being effective to stabilize said plunger in the tick-over speed position.

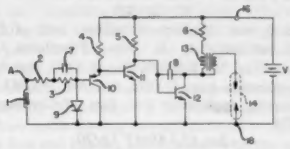
4,112,903

IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Noboru Sugiura, Nakamachi, and Seiji Suda, Mito, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 6, 1976, Ser. No. 702,896
Claims priority, application Japan, Jul. 4, 1975, 50-81794
Int. Cl.[2] F02P *3/02*
U.S. Cl. 123—148 E **8 Claims**

1. An ignition system for an internal combustion engine comprising an ignition coil having a primary winding, switching means connected to said primary winding for controlling the current flow therethrough, generating means for producing alternating signals in timed relationship with engine rotation, and control means responsive to said alternating signals for controlling the operation of said switching means, said control means including a first transistor connected to said generating means and operated in accordance with the alternating signals therefrom, and a second transistor having substantially identical temperature characteristics as said first transistor and being of opposite conductivity type connected between said first transistor and said switching means such that the conduction of said first transistor biases said second transistor into non-conduction, and such that the temperature effects of the base to emitter paths of these transistors compensate each other.

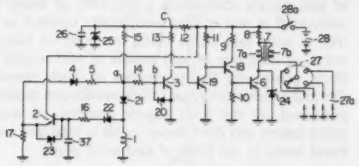


4,112,904

ELECTROMAGNETIC TYPE CONTACTLESS IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINE

Eiichi Uno, Toyota, and Takasi Hachiga, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 6, 1976, Ser. No. 747,870
Claims priority, application Japan, Dec. 8, 1975, 50-146616
Int. Cl.[2] F02P *3/04*
U.S. Cl. 123—148 E **1 Claim**



1. An electromagnetic type contact ignition apparatus for an internal combustion engine of the type including a battery, and an ignition coil having a primary coil and a secondary coil connected with spark plugs;

said ignition apparatus comprising:

timing means for generating an output signal in timed relationship with the engine, said timing means including a pickup coil whose one end is grounded and a diode with its cathode connected with the other end of said pickup coil;

an input transistor having a base connected with the anode of the diode of said timing means to be conductive and non-conductive in response to the output signal of said timing means;

switching means connected in series with said battery and the primary coil of said ignition coil said switching means responsive to said input transistor for charging and discharging said ignition coil with an electric energy in response to the output of said timing means; and

operating level control means connected with said input transistor in parallel with said timing means for applying to said input transistor a DC bias voltage which increases as the rotational speed of said engine increases, last said means including a control transistor having an emitter-collector path connected with said battery, a capacitor charging circuit, a capacitor discharging circuit and an operating level supplying diode with its cathode connected through a resistor with said input transistor, said capacitor charging circuit including a diode with its anode connected with said other end of said pickup coil, a resistor and a capacitor with its one end being grounded, said capacitor discharging circuit including said capacitor, the base-emitter path of said control transistor and a resistor with its one end being grounded with its other end being

connected with the anode of said operating level supplying diode.

4,112,905

SPARK PLUGS FOR INTERNAL COMBUSTION ENGINES

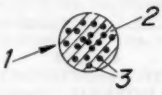
Dieter Stöckel, and Friedrich Schneider, both of Pforzheim, Germany, assignors to G. Rau, Pforzheim, Germany

Continuation of Ser. No. 530,500, Dec. 6, 1974, abandoned. This application Aug. 4, 1976, Ser. No. 711,683

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1973, 2361274

Int. Cl.[2] H01T *13/20*

U.S. Cl. 123—169 EL **17 Claims**



1. In an internal combustion engine spark plug of the type including a center electrode, the improvement wherein said center electrode comprises:

a length of fibre reinforced material made up of at least two metals, a first of said metals forming a matrix and a second of said metals comprising a plurality of wires or fibres embedded in and solidly metallically bonded to said matrix, at least said fibres being made up of initially solid wires, at least one of said metals of said matrix and said fibres possessing the properties of high electrical and thermal conductivity, said fibre reinforced material being produced by the joint plastic shaping of wire-shaped initial matrix and fibre metals, with at least said initial fibre metal being in the form of said solid wires.

4,112,906

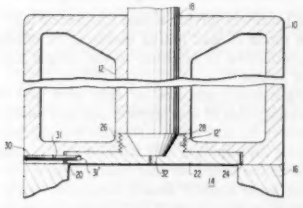
FIRING DECK INSERT FOR INTERNAL COMBUSTION ENGINES

Boyd La Russell Spencer, Gladewater, Tex., assignor to Spencer Heads, Inc., Gladewater, Tex.

Filed Dec. 20, 1976, Ser. No. 752,271

Int. Cl.[2] F02F *1/24*

U.S. Cl. 123—191 A **11 Claims**



1. A replaceable firing deck insert for an internal combustion engine having a coolant jacketed engine body including at least one combustion chamber and having a firing deck surface with a critical area surrounding an ignition device and subject to thermal stresses, the ignition device being sealed from the coolant jacket by a generally tubular shaped wall structure and the firing deck surface having a circular counterbore recess in the critical area thereof and disposed axially of the ignition device, and having an axially disposed internally threaded bore extending into the tubular wall structure, said insert comprising a circular body to be nested in and to conform to the counterbore recess with peripheral clearance and to cover at least a portion of the critical area of the firing deck surface, the diameter of said insert being slightly smaller than that of the counterbore recess with the peripheral edge of said insert spaced from the peripheral wall of the counterbore recess and providing the peripheral clearance as an expansion area for said insert to accommodate absorption by said insert of heat and strain independently of the engine body, and a centrally disposed externally threaded boss of reduced diameter extending axially from the inner surface of said insert body and threadable into the internally threaded bore in the engine body for securing the insert and body together, the thickness of said insert being substantially equal to the depth of the counterbore with the exposed surface of said insert generally contiguous with and conforming to the engine body surface surrounding the counterbore, said boss having an axially disposed opening therethrough and including a portion defining a seat for the ignition device and an opening for exposing the ignition device to the combustion chamber, whereby said insert body is centrally fixed by said boss relative to the point of combustion in the chamber but is free to expand radially from said boss as it absorbs heat of combustion without stress or strain.

4,112,907

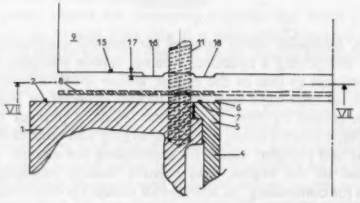
METHOD AND DEVICE FOR ENSURING THE TIGHTNESS OF A CYLINDERHEAD ON THE CYLINDER BLOCK OF A THERMAL ENGINE, IN PARTICULAR, A DIESEL ENGINE

Jean Nikly, Caluire, France, assignor to Automobiles M. Berliet, Lyons, France

Filed Jul. 2, 1975, Ser. No. 592,783

Int. Cl.[2] F02F *1/10*

U.S. Cl. 123—193 CH **1 Claim**



1. A device for securing together a cylinder block and a cylinderhead of an engine with an interposed gasket which bears on the raised top of at least one liner disposed in said cylinder block, comprising:

a plurality of screws disposed around said liner and oriented substantially parallel to the longitudinal axis of said liner;

the stem of each said screw passing through said cylinder head and gasket into said cylinder block intermediate to support portions of substantially equal thickness, said support portions being disposed between the top major surface of said cylinder block and the bottom major surface of said cylinderhead;

one of said support portions being defined by the raised portion at the top of said liner;

each said screw being mounted intermediate said support portions in the manner of a compensator to provide for balancing the stresses at the time of tightening said cylinderhead;

at least a first raised support portion, on one side of each said screw, located between the opposite planes of said cylinderhead and said cylinder block, the thickness of said first support portion being substantially equal to the thickness of a second raised support portion located on the other side of said screw and comprising the projecting portion of said top of the corresponding cylindrical liner;

a cylinderhead gasket the thickness of which is substantially

constant, and a first support portion defined by a raised strip projecting from the underface of the cylinderhead; and

the underface of the cylinderhead including another raised portion having a substantially circular shape, which projects outside the plane of assembly of the cylinderhead above the flange of the liner.

4,112,908

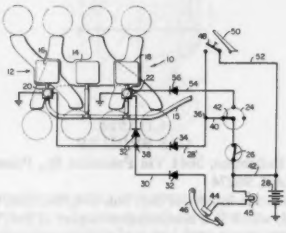
FUEL SYSTEM MODIFICATION

Robert Kuitunen, 8145 Highway 85, Riverdale, Ga. 30274

Filed Jun. 28, 1976, Ser. No. 700,230

Int. Cl.[2] F02D *13/06*

U.S. Cl. 123—198 F **1 Claim**



1. An economizing fuel supply system for multi-cylinder internal combustion engines having first, second and third groups of cylinders and further having conventional accelerator pedal and brake pedal linkages, comprising:

(a) a first carburetor on said engine to continuously supply fuel to said first group of cylinders;

(b) a second carburetor on said engine to supply fuel to said second group of cylinders;

(c) a third carburetor on said engine to supply fuel to said third group of cylinders;

(d) an electrical switching circuit including an accelerator pedal switch operable upon a predetermined movement of said accelerator pedal and a brake pedal switch operable upon a predetermined movement of said brake pedal, said accelerator pedal switch and said brake pedal switch independently operable to actuate said second and third carburetors simultaneously; and

(e) a manually operable switch in said circuit for selective actuation among said first carburetor, a combination of said first, second and third carburetors and a combination of said first and second carburetors.

4,112,909

COMPOUND BOW

Joseph M. Caldwell, Tujunga, Calif., assignor to Jennings Compound Bow, Inc., Valencia, Calif.

Continuation of Ser. No. 582,717, Jun. 2, 1975, abandoned. This application May 2, 1977, Ser. No. 793,089

Int. Cl.[2] F41B *5/00*

U.S. Cl. 124—23 R **26 Claims**

1. In a compound bow having a center handle portion, upper and lower limbs having inner ends connected to the center portion and free outer ends, and upper and lower draw pulleys mounted respectively on the free outer ends of the upper and lower limbs, the improvement comprising:

each of said draw pulleys having a peripheral portion, a central portion extending diametrically through the center of the pulley, first and second spaced grooves in said peripheral portion, and a passage leading through said central portion and connecting said first and second grooves;

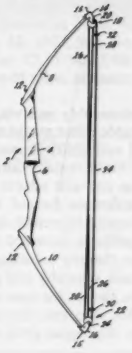
each pulley having an inner surface portion and an outer surface portion on said peripheral portion with the inner surface portion facing said bow with the bow in its rest position and the outer surface portion directed away from said bow with the bow in its rest position;

a pivotal mounting for each of said pulleys with the pulleys being eccentrically positioned for rotational movement with respect to said mountings during draw of the bow;

each of said mountings being positioned relative to one of the pulleys on a radial line passing through the approximate geometric center of the pulley with said mounting being disposed off-center on said radial line so that said line is divided into a shorter line segment and a longer line segment by the position of the mounting on said line;

a first draw cable having one end secured to the lower limb and a free end passing into contact with the inner surface portion of the first groove on the upper draw pulley with the bow in its rest position, then passing through the passage in the upper pulley into the second groove, and then passing over the inner surface portion of the second groove and into contact with the outer surface portion of the second groove;

a second draw cable having one end secured to the upper



limb and a free end passing into contact with the inner surface portion of the first groove on the lower draw pulley with the bow in its rest position, then passing through the passage in the lower pulley into the second groove and then passing over the inner surface portion of the second groove and into contact with the outer surface portion of the second groove, and

a bowstring interconnecting the free ends of the first and second draw cables,

whereby with the bow in its rest position each of the draw pulleys are positioned with said longer line segment directed toward the inner end of the bow limb supporting the pulley and said shorter line segment directed toward the outer end of the bow limb supporting the pulley and with each of the pulleys undergoing rotation during draw of the bow to a position with said longer line segment directed toward the outer end of the bow limb supporting the pulley and said shorter line segment directed toward the inner end of the bow limb supporting the pulley with each of the bow limbs being effectively lengthened during draw of the bow.

4,112,910

PRE-LUBE DEVICE

Donald W. Percy, Londonberry, N.H., assignor to Prelube Corporation, Derry, N.H.

Filed Apr. 23, 1976, Ser. No. 679,828

Int. Cl.[2] F01M *1/00*

U.S. Cl. 123—196 S **6 Claims**

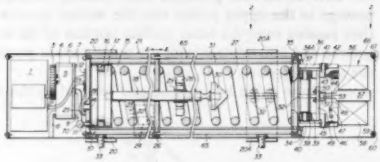
1. A device for lubricating an internal combustion engine upon ignition and prior to the start thereof, comprising:

chamber means for storing a quantity of oil of sufficient amount to prelubricate said engine, said chamber means being adapted for fluid communication with said engine,

pump means in fluid communication with an oil pan of the engine and with said chamber means for the supplying oil under pressure to said chamber,

rigid moveable piston means disposed within said chamber for evacuating oil from the chamber to said engine, said piston means having an elongated rod associated therewith; said piston rod having a head mounted to an end surface thereof,

power chamber means disposed adjacent to said oil chamber means, said power chamber means including power spring means, at least one surface of which abuts said piston means for moving the piston means under pressure within



said oil chamber means in order to evacuate oil therefrom, and

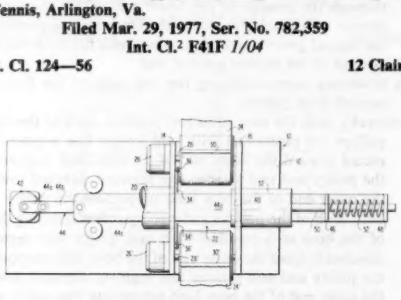
locking means for releaseably receiving said piston rod head, comprising moveable roller means adapted to receive and secure said head said roller means comprising multiple rollers adapted to move radially outwardly from the diameter of said piston rod and adapted to secure said head around the circumference thereof, in order to secure said piston means associated therewith against movement such that when said ignition is actuated it causes movement of said roller means thereby releasing said head and said power spring means, whereby said piston means is moved under pressure in such a manner as to evacuate the oil from said chamber into and throughout said engine in order to lubricate the engine prior to start.

4,112,911

BALL COLLECTOR AND PROJECTOR APPARATUS

Paul J. Petrick, Sr., Joppa, Md., assignor to Shooting Star Tennis, Arlington, Va.

Filed Mar. 29, 1977, Ser. No. 782,359
Int. Cl.[2] F41F *1/04*
U.S. Cl. 124—56 **12 Claims**



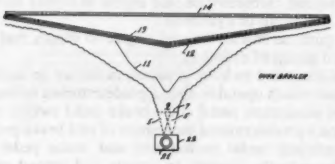
1. An apparatus for collecting and transporting generally spherical objects such as conventional tennis balls comprising a frame defining a chamber having an upper inlet opening adapted to receive a said spherical object and a delivery zone adjacent thereto, and an upwardly-extending member defining an object exit port adjacent said delivery zone and of sufficient size to permit a said spherical object to pass therethrough; said delivery zone being dimensioned so as to allow only one spherical object at a time to enter therein; an object moving and support means having ridges outwardly extending therefrom for directing said spherical objects to said inlet opening to pass by gravity to said delivery zone of said chamber; an object transport means in communication with said object exit port; resilient restraining means adjacent to said object exit port sufficient to restrict said spherical object from passing from said delivery zone through said object exit port; contact means in said delivery zone and in normal spaced alignment with said object exit port adapted to be activated to contact and force a said spherical object held by said resilient restraining means through said resilient restraining means and said object exit port into said transport means; and resilient drive means for activating said contact means to move said contact means between a normally open position in which a said spherical object can pass to the chamber and a contact position in which said contact means forces said object through said object exit port.

4,112,912

GAS BROILER

Earle W. Ballentine, 3641 Via Palomina St., Palos Verdes Estates, Calif. 90274

Continuation-in-part of Ser. No. 696,791, Jun. 16, 1976, abandoned, which is a continuation-in-part of Ser. No. 610,563, Sep. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 582,737, Jun. 2, 1975, abandoned. This application Aug. 22, 1977, Ser. No. 826,463
Int. Cl.[2] A47J *37/00*
U.S. Cl. 126—41 R **14 Claims**



1. An oven-broiler for gas ranges comprising:

burner means for producing a combustible stoichiometric air-gas mixture, the burner means having chamber means with a planar top surface and an inlet for connection to a source of gaseous fuel, air for combustion flowing across the top surfaces;

aperture means positioned in the planar top surface of the chamber means for discharging free turbulent jets entraining a quantity of combustion air required for stoichiometric combustion of the gaseous fuel, said aperture means being arranged in a specific geometric array wherein the lineal distances between the apertures are identical and are approximately equal to the product of, (a) the stoichiometric air-gas ratio, (b) the aperture diameter, (c) a constant of proportionality which has a value of 2.42 and (d) the ratio of the Rankine temperatures of the gaseous fuel and the combustion air, said turbulent jets coalescing in the stoichiometric demarcation plane which is parallel to the planar top surface of the chamber means;

a first radiator means centered over the burner means and heated by the combustion products produced by the burner means;

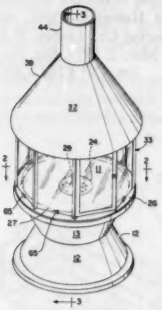
a second radiator means heated by the cooled combustion products; and

broiler pan means positioned below the burner means for supporting food to be broiled.

4,112,913
FREE STANDING HEATING UNIT

Ronald J. Shimek, Rte. 3, Lakeview Dr., Prior Lake, Minn. 55372, and Daniel C. Shimek, 2090 Fairmount, St. Paul, Minn. 55105

Filed Mar. 15, 1977, Ser. No. 777,688
Int. Cl.[2] F24B *1/18*
U.S. Cl. 126—120 **16 Claims**

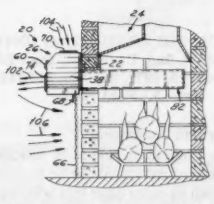


1. A free standing heating unit comprising:
base support means having a draft inlet therein,
a firebox chamber mounted on said base support means and having;
a substantially annular ring shaped floor means mounted on said base support means forming the floor of said firebox chamber,
an apertured grate mounted on said ring shaped floor means providing a central forge draft intake therethrough,
an outer vertical ring shaped deflector plate mounted on said ring shaped floor means,
a plurality of vertical columns mounted at the outer circumference of said floor means,
dome means mounted on said vertical columns forming the top and the outlet of said firebox chamber,
radiant panels mounted between adjacent vertical columns forming the sides of said firebox chamber, and
means supporting said radiant panels and for providing a horizontal space between the bottom of said radiant panels and said annular ring shaped floor means, whereby there is provided a horizontal edge draft intake through said space which confines the fire and smoke to the center of said firebox chamber.

4,112,914
COMBINED FIREPLACE HOOD AND HEATING UNIT

Rex M. Brown, 435 E., 1st N., Smithfield, Utah 84335

Continuation-in-part of Ser. No. 538,102, Jan. 2, 1975, abandoned. This application Aug. 20, 1975, Ser. No. 606,063
Int. Cl.[2] F24B *7/04*
U.S. Cl. 126—121 **32 Claims**

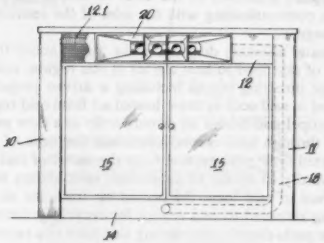


16. A combined fireplace hood and heating unit adapted to be mounted as a unit to a pre-existing fireplace having a fireplace opening and a fireplace hearth, said unit comprising a hood having the form of an elongated, enclosed housing, means providing intake and exhaust vents in said housing, heat exchanging means connecting said intake and exhaust vents, a blower carried within said hood to forcibly move air through said heat exchanging means, and means supporting said unit in the upper portion of said fireplace opening beneath the fireplace lintel such that said hood is carried externally of said fireplace and said heat exchanging means extend horizontally over the fireplace hearth, the rearward end of said heat exchanging means being spaced from the back wall of the fireplace.

4,112,915
FIREPLACE ENCLOSURE WITH HEAT EXCHANGER

John W. Slavik, 5275 Mahoning NW., Warren, Ohio 44485

Filed Apr. 11, 1977, Ser. No. 786,409
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 **18 Claims**



1. A unitary structure for use with a fireplace, comprising:
a flat metal frame that has an outline greater than the opening of a fireplace and adapted to be positioned flatwise of and in abutment with surfaces bordering the fireplace opening, said frame defining a fire view opening therethrough,
glass door means for spanning and closing said frame opening and preventing any substantial amount of heated air and products of combustion from the fire in said fireplace to flow through said frame opening and into the room in which said fireplace is located, said door means being movably mounted on said frame for movement to uncover said frame opening and thereby provide access to the fire in said fireplace,
an air heating device unitarily connected to said frame for bodily movement therewith, including heat exchange conduit means extending rearwardly from the upper portion of said frame and substantially concealed therebehind, air inlet means connected to said conduit means and extending forwardly through said frame and adapted to receive cool air from said room, and air outlet means connected to said conduit means and extending forwardly through said frame for expelling heated air into said room,
said air heating device being disposed in operative position within said fireplace in unobstructing relation to the area rearwardly of said glass door means to provide full view and enjoyment of the fire with said conduit means above the fire when said frame is positioned flatwise of and in abutment with said surfaces bordering said fireplace opening.

4,112,916

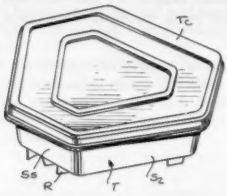
HOT AIR OVEN FOR FOOD-LOADED CARTRIDGES

Raul Guibert, 8343 W. 4th St., Los Angeles, Calif. 90048

Continuation-in-part of Ser. No. 713,977, Apr. 12, 1976. This application Mar. 11, 1977, Ser. No. 776,772

Int. Cl.[2] A47G *23/04*

U.S. Cl. 126—261 **15 Claims**



1. A hot-air oven for heating food comprising:

A. a turntable having a slightly raised annular shelf for supporting a load of food in a toroidal configuration, the space between said shelf and said turntable defining a restricted flow passage whose inlet is at the inner periphery of said shelf and whose outlet is at the outer periphery thereof, said load having a hollow central core whose boundary is defined by the inner surface of the load, said core communicating with the inlet of the restricted flow passage;

B. a heater assembly disposed in the region above the upper end of said load to heat the air in this region; and

C. flow directing means including a driven propeller disposed in said core to draw heated air from said region and to propel said heated air downwardly in a flow path passing through said central core into the inlet of said restricted flow passage, and from the outlet of said passage upwardly to create an air curtain surrounding the outer surface of said load, the heated air from the air curtain being returned to said region for recycling through said flow path, thereby enveloping said load in a recirculating toroidal flow pattern.

4,112,917

SOLAR-RAY HEATING APPARATUS

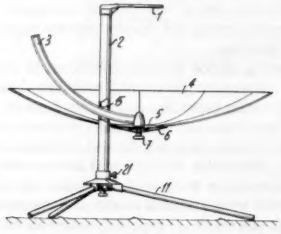
Roger Lang, 16, chemin de Roilbot, Chambesy, Geneva, Switzerland (CH-1292)

Filed Jan. 25, 1977, Ser. No. 762,276

Claims priority, application Switzerland, Jan. 29, 1976, 1105/76

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **8 Claims**



1. A solar-ray heating apparatus comprising a support, said support including a vertically extending post, means fixed on the upper part of the post and carrying an object to be heated, a concave reflector for converging the sun's rays to a focal point, and means mounted on said post and connected to the reflector for movement of the reflector relative to the post to enable orientation of the reflector relative to the sun, said connecting means allowing movement of the reflector only between positions in which said focal point remains substantially coincident with a location on said means at the upper part of the post for carrying an object to be heated.

4,112,918

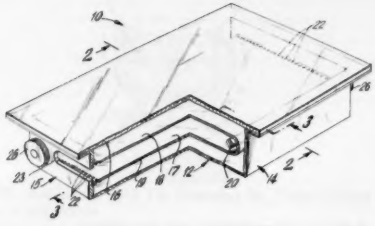
SOLAR ENERGY COLLECTOR

Mark Palkes, East Hampton, Conn., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Mar. 2, 1977, Ser. No. 773,706

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **6 Claims**



1. A solar heat collector, comprising:

a generally rectangular frame having a base and end walls and side walls extending upwardly therefrom;

a generally rectangular cover plate transparent to solar radiation disposed on top of said frame defining a chamber between the base and the cover plate;

a solar absorbing surface disposed within said chamber in heat transfer relationship with a fluid in said chamber;

an inlet and an outlet in the end walls of said frame communicating with said chamber;

a movable solar reflecting surface located within said chamber, said solar reflecting surface being a flexible stratum capable of being rolled and having geared teeth engaging openings in the marginal edges thereof;

a roll located in said chamber to which said stratum is operatively connected, whereby said stratum is rolled around said roll when said surface is positioned to expose said solar absorbing surface;

means for positioning said movable reflective surface so as to at least partially cover said solar absorbing surface when the temperature within the collector exceeds a predetermined high temperature whereby incident solar energy is at least partially reflected thereby; and

means for positioning said movable reflective surface so as to at least partially expose said solar absorbing surface when the temperature within the collector falls below a predetermined minimum temperature whereby incident solar energy is at least partially absorbed thereby.

4,112,919

WINDOW SOLAR HEATING UNIT

Edwin J. Davis, 2329 W. 2nd, Davenport, Iowa 52802

Filed Jun. 13, 1977, Ser. No. 805,915

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—270 **1 Claim**

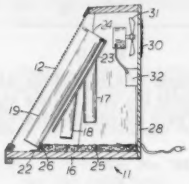
1. A solar heating unit comprising:

a chamber having a mounting side to be attached to a building, an opposite transparent side to be exposed to the sun, and a bottom with an outer edge that is bowed outwardly; said mounting side having upper and lower openings through upper and lower portions respectively of the mounting side to permit flow of air between said chamber and the building to which said solar heating unit is at-

tached, said transparent side facing slantingly upwardly for exposure to the sun,

a baffle plate having a slanting portion substantially parallel with said transparent side and an upper portion laterally across said chamber in proximity to said upper opening, said slanting portion to said baffle plate and said transparent side being spaced apart to define a heating space therebetween and each being bowed and gradually flared outwardly in a downward direction, a lower edge of said slanting portion of said baffle being above said bottom to provide a passageway between the bottom of said heating space and said lower opening,

a plurality of absorptive tubes, said upper portion of said baffle plate having an opening for each of said absorptive tubes, said absorptive tubes having respective upper ends



positioned within respective ones of said openings through said baffle plate, said absorptive tubes extending from said respective openings downwardly and outwardly within said heating space and having respective open lower ends approximate said passageway that communicates with said lower opening, different ones of said openings through said upper portion of said baffle plate being at different distances from a lateral edge of said upper portion of said baffle plate to provide different slants to said respective absorptive tubes and thereby to position walls of different ones of said absorptive tubes nearly perpendicular to the direction of the sun at different times of the day, and said upper ends of said absorptive tubes communicating through partitioned space above said upper portion of said baffle to said upper opening through said mounting side.

4,112,920

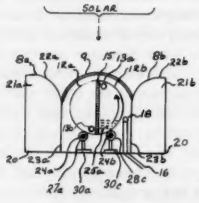
SOLAR LIQUID/AIR HEATER

Edwin K. Hillman, 907 W. Desert Cove, Phoenix, Ariz. 85029

Filed Aug. 16, 1976, Ser. No. 714,917

Int. Cl.[2] F24J *3/02*; **F24H** *7/00*

U.S. Cl. 126—271 **12 Claims**



1. Apparatus for utilizing solar energy to heat a fluid, said apparatus comprising in combination:

a. a rotatable tank for housing the fluid to be heated, said tank including first and second compartments defined by a tank divider element for alternately cyclically absorbing heat energy from the sun and transferring the absorbed energy to the fluid;

b. means for cyclically rotating said tank to sequentially repetitively subject said first and second compartments to radiant energy from the sun and sequentially repetitively heat said first and second compartments;

c. means for periodically introducing and withdrawing fluid from a heated one of said first and second compartments to effect a heat transfer from the heated one of said first and second compartments to the fluid;

d. means for directing radiant energy from the sun to said tank; and

e. means for reducing heat loss from said tank through convection;

whereby, a heated one of said first and second compartments transfers heat to a fluid temporarily introduced thereinto while the remaining one of said first and second compartments absorbs radiant heat from the sun preparatory to temporary introduction thereinto of fluid to be heated.

4,112,921

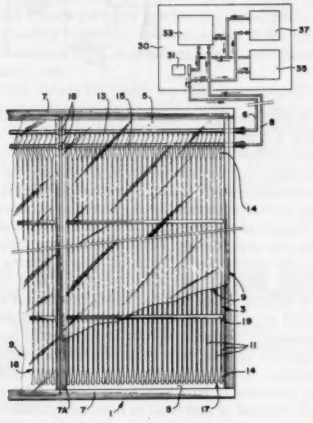
METHOD AND SYSTEM FOR UTILIZING A FLEXIBLE TUBING SOLAR COLLECTOR

Calvin Dodd MacCracken, Englewood, N.J., assignor to Calmac Manufacturing Corporation, Englewood, N.J.

Continuation-in-part of Ser. No. 790,484, Apr. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 692,887, Jun. 4, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 846,112

Int. Cl.[2] F24D *3/02*

U.S. Cl. 126—271 **29 Claims**



1. The method of transferring heat from the radiant energy of the sun to a recirculating liquid system comprising the steps of:

a. laying lightweight insulating material on a surface receiving heat from the sun,

b. covering the exposed surface of said insulating material with a coating of mastic adhesive,

c. laying in the mastic coating a mat consisting of multiple lengths of closely-spaced, parallel black flexible synthetic tubing members running lengthwise held in a grid pattern by securing means so that the mat length is many times greater than its width,

d. connecting adjacent pairs of first ends of said tubing members to each other at one end of said mat by means of U-shaped conduit pieces,

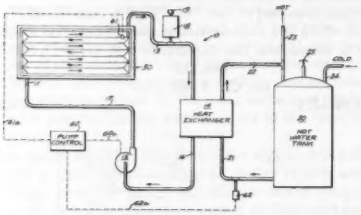
c. providing supply and return headers extending across the other end of said mat and connecting said supply and return headers alternately to the second ends of said tubing members with the direction of flow of the circulating liquid being opposite in neighboring tubing members in the mat,

f. forming a raised perimeter of insulating material enclosing said mat on all four sides,
g. attaching a cover sheet of translucent solar energy transmitting material to said raised perimeter for creating an enclosed air space above said mat,
h. covering the exposed surfaces of the perimeter insulating material with watertight adhesive,
i. providing pipes leading to and from a recirculating pumped heat utilizing system and
j. connecting the supply and return headers to the supply and return pipes.

4,112,922
SOLAR ENERGY COLLECTOR

Leon S. Skinner, and Norman C. Taylor, both of Miami, Fla., assignors to All Sunpower, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 669,487, Mar. 23, 1976, abandoned. This application Oct. 3, 1977, Ser. No. 838,975
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **9 Claims**



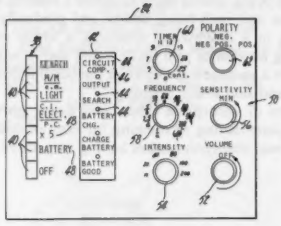
1. In a solar energy collector, a flat coil tubular array for circulating a heat transfer fluid through a single continuous serpentine conduit comprising a plurality of rigid straight tube sections extending substantially the length of the array and arranged in side-by-side parallel relation defining the width of the array, each tube section having a central conduit and longitudinal flanges along opposite sides of the conduit, substantially flat top and bottom walls defining the cross-sectional shape of the conduit as a flattened ellipse having the width substantially greater than the thickness, said longitudinal flanges of adjacent tube sections being positioned in abutment and welded together into a rigid structure with the tube sections disposed in coplanar relation, a plurality of headers interconnecting the ends of pairs of adjacent tube sections in staggered relation and having conduit sections communicating with the conduits of said pairs of adjacent tube sections for 180° flow reversal of said fluid to form said continuous serpentine conduit, each header having a pair of conduit end edges cut to abut conduit end edges of said pair of interconnected adjacent tube sections and being joined together by a welded waterproof seam extending completely around each conduit, and end portions of said longitudinal flanges being cut away for accessibility for welding and visibility for inspecting each of said welded seams.

4,112,923
ANTONOMIC TRANSCUTANEOUS AFFECT DEVICE

Jerry J. Tomecek, 10730 Kennicott Trail, Brighton, Mich. 48116

Filed Aug. 24, 1976, Ser. No. 717,254
Int. Cl.[2] A61N *1/00*
U.S. Cl. 128—1.3 **12 Claims**

1. A device for detecting and treating points of impedance imbalance in a warm blooded animal to effect an autonomic transcutaneous affect to the tissues of the body, comprising:
(a) a housing,
(b) a battery disposed in the housing,
(c) a plural polarity power supply electrically connected to the battery,
(d) a plurality of logic circuits electrically connected to the power supply and controlling plural forms of energy outputs, each of the logic circuits defining means for varying the output of the power supply into electrical, magnetic or light energy, each logic circuit having an output associated therewith, and

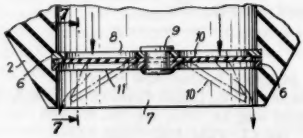


(e) means associated with each of the associated logic circuits for applying the output of the logic circuits to the tissue area to have the affect applied thereto.

4,112,924
BLOOD COLLECTION VALVE

Louis Thomas Ferrara, 2988- Ave. T, and Janet Roccisano, 2169- E. 36th St., both of Brooklyn, N.Y. 11229

Filed Apr. 7, 1977, Ser. No. 785,656
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—2 F **4 Claims**



1. A non-return, or one way blood collection valve assembly essentially comprising in combination: three thin walled circular disk-like elements, two of which are substantially rigid, and having nearly the same diameter act thereby as supportive structures for the third element, which being of a diameter substantially intermediate of the other two elements and also thinner, is sandwiched inbetween said rigid elements, being affixed thereto by suitable means such as a rivet at the center of the entire assembly and being able to oscillate such as in an open and closed position intermittently said thinner element or membrane acts by flexion to allow blood to pass or enter in one direction whereby said valve assembly is held in place by the larger of the ridged elements at its circumferential edge within the confines of a hollow stopper-like element by a ridge that circumscribes the inner wall of said stopper; and said stopper being of a compliant nature such as rubber so as to allow intermittent penetration of a cannula, is used to intermittenly seal the opened end of an elongated tubular element which has been previously evacuated substantially of air and serves thereby to recieve and store blood as it enters via said cannula and pass the valve.

4,112,925
BLOOD SAMPLE CONTAINER HAVING AN ANTICOAGULANT COATING OF POLYVINYL PYRROLIDONE AND A SALT OF ETHYLENE DIAMINE TETRACETATE

Kevin J. Sullivan, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 679,166, Apr. 22, 1976, Pat. No. 4,069,185. This application Jun. 10, 1977, Ser. No. 805,525

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2 F **1 Claim**

1. A blood sample container comprising

a capillary tube, and

an anticoagulant coating applied to the interior surface of said capillary tube consisting essentially of from about 10 percent to about 95 percent by weight of a salt of ethylene diamine tetracetate, and from about 5 percent to about 90 percent by weight of polyvinyl pyrrolidone.

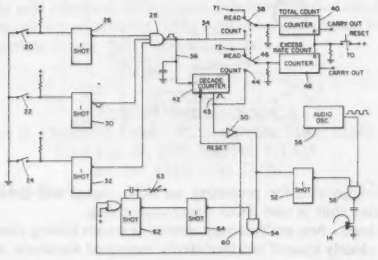
4,112,926
METHOD AND APPARATUS FOR MEASURING AND TREATING HYPERACTIVITY IN HUMAN BEINGS

Jerome L. Schulman, Chicago, and Jay Kaplan, Buffalo Grove, both of Ill., assignors to The Children's Memorial Hospital, Chicago, Ill.

Filed Dec. 8, 1976, Ser. No. 748,518

Int. Cl.[2] A61B *5/10*

U.S. Cl. 128—2 S **14 Claims**



1. A method of measuring hyperactivity in a human being comprising the steps of:

(a) detecting physical movement of said human;

(b) incrementing a first counting means each time physical movement is detected;

(c) repetitively generating a timing interval;

(d) determining when the number of physical movements during said timing interval exceed a selected maximum thereby indicating hyperactivity;

(e) incrementing a second counting means and initiating a new timing interval each time the selected maximum is exceeded;

(f) periodically reading out the values stored in the first and second counting means,

whereby the degree of hyperactive behavior may be determined.

4,112,927
ULTRASONIC DETECTOR WITH AUDIBLE INDICATION SIGNAL

David L. Carlson, Ames, Iowa, assignor to Renco Corporation, Minneapolis, Minn.

Continuation of Ser. No. 637,825, Dec. 4, 1975, abandoned. This application Apr. 6, 1977, Ser. No. 785,174

Int. Cl.[2] A61B *10/00*

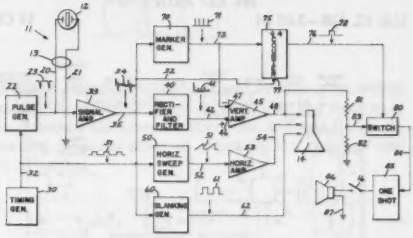
U.S. Cl. 128—2 V **11 Claims**

1. Ultrasonic animal pregnancy detection apparatus with automatic audible pregnancy indication, comprising:

(a) means for transmitting ultrasonic energy pulses and for receiving return pulses including a probe for placement on the body of the animal to be checked;

(b) signal amplifier means for amplifying said pulses received by said transmitting and receiving means, said signal amplifier means having an amplification factor independent of the pulse propagation conditions within the animal's body;

(c) means for generating a gating signal commencing after a predetermined time delay following the transmission of an ultrasonic energy pulse and continuing for a predetermined time interval, said time delay and time interval corresponding generally to the return pulse expected from the uterus of said animal;



(d) means for generating an audible signal in response to an amplified return pulse of predetermined amplitude, said predetermined amplitude corresponding to the amplitude of a return pulse from an enlarged uterus indicating animal pregnancy; and

(e) switching means for receiving said gating signal and for selectively transmitting amplified return pulses from said amplifier means to said audible signal generating means only during the time intervals defined by said gating signal, whereby the presence or absence of the expected return pulse is automatically audibly indicated.

4,112,928
ERGOMETER

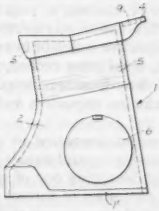
Peter Ulrich Putsch, Rockenhausen, Germany, assignor to Keiper Trainingsysteme GmbH & Co., Rockenhausen, Germany

Filed Sep. 8, 1976, Ser. No. 721,436

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1975, 2540493

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—2.05 R **9 Claims**



1. An ergometer for measuring and indicating physical exercise parameters comprising a housing including means for a user to apply physical energy into the ergometer, a digital computer disposed in said housing having digital display means arranged for ready observation by the user for determining and indicating at least one of said exercise parameters during the application of physical energy by the user, said computer including a memory for storing said exercise parameters and at

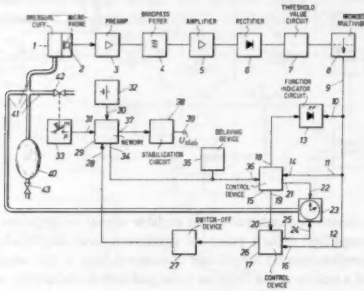
least one program, input unit means for providing said computer with values corresponding to personal data regarding the user, and means for the user to selectively summon from said computer during use information corresponding to said exercise parameters for display on said digital display means.

4,112,929

METHOD FOR MEASURING THE BLOOD PRESSURE OF A PATIENT

Karl-Heinz Affeldt; Günther Fritzsche; Joachim Ganzke, and Gerhard Raupach, all of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 1, 1977, Ser. No. 812,402
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—2.05 M **14 Claims**



3. Apparatus for measuring the blood pressure of a subject according to the Riva-Rocci/Korotkoff method, said apparatus comprising

an inflatable pressure cuff arranged to be placed in pressure-transmitting relation with an artery of the subject;

manually-operable inflating means connected for inflating said cuff;

a controllable valve connected for permitting a pressure previously established within the cuff to decrease gradually;

an electromechanical signal transducer arranged to be in sound-receiving communication with the artery in the region of said cuff when said cuff is in pressure-transmitting relation with the artery;

signal processing means connected to said transducer for converting those electrical signals from said transducer which correspond to Korotkoff sounds into control signals;

a dual indicator manometer having first and second pressure value indicators connected to respond to the pressure in said cuff, and first and second electromagnets each associated with a respective indicator in a manner that each said electromagnet, upon being excited, releases its respective indicator to follow pressure variations and, upon being deexcited, locks its respective indicator at its present position;

control circuit means connected to said signal processing means for receiving control signals therefrom and to said manometer for deexciting one of said electromagnets at the onset of a succession of control signals and deexciting the other of said electromagnets at the termination of such succession of control signals;

means defining an electronic block connected to said control circuit means and actuable to provide an output which maintains said electromagnets in their excited state;

electrical power supply means constituting a source of operating power for said control circuit means and said electronic block means, and

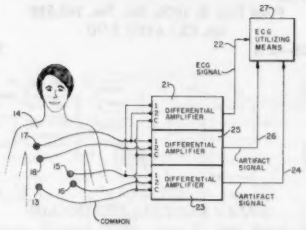
a two-position manually operable switch operatively associated with said valve, said control circuit means, said means defining an electronic block and said power supply means and switchable between a first position in which it effects closing of said valve, supply of power from said power supply means to said control circuit means, excitation of said electromagnets and actuation of said electronic block means, and a second position in which it effects opening of said valve to permit gradual reduction of the pressure previously established in said cuff, and deactuation of said electronic block means, and permits said control circuit means to be controlled by the control signals from said signal processing means and to terminate supply of power from said power supply means when both of said electromagnets have been deexcited.

4,112,930

APPARATUS AND METHOD FOR ECG BASELINE SHIFT DETECTING

Charles L. Feldman, and Mark Hubelbank, both of Sudbury, Mass., assignors to Electronics for Medicine, Inc., Pleasantville, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,538
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.06 R **7 Claims**



1. Apparatus for providing an ECG signal and detecting baseline shift in said ECG signal comprising,

at least a first multielement electrode means having elements closely spaced but insulatedly separated electrode means for connection to a first surface portion of a patient for providing a first ECG potential and also for providing therebetween a signal representative of baseline shift while the ECG potential therebetween is negligible,

first means for differentially combining the potentials on said elements of said first electrode means to provide a first artifact signal representative of a baseline shift in said first ECG potential,

at least another electrode means for contacting a second surface of said patient for providing a second ECG potential different from said first ECG potential,

and second means for differentially combining said first and second ECG potentials to provide an ECG signal.

4,112,931

TIDAL VOLUME DISPLAY

Henry L. Burns, St. Helena, Calif., assignor to Cavitron Corporation, New York, N.Y.

Filed Jan. 5, 1977, Ser. No. 757,129
Int. Cl.[2] A61B *5/08*
U.S. Cl. 128—2.08 **44 Claims**

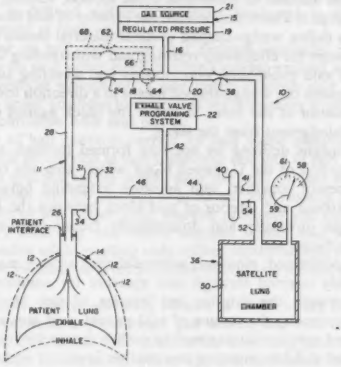
1. A method of indicating the volume of gas supplied to a patient, comprising the steps of:

A. supplying a flow of gas under pressure to a patient from a supply of gas,

B. providing a fixed volume chamber operatively coupled to said supply of gas to receive another flow of said gas therein,

C. controlling said flows of said gas to the patient and to said chamber on an intermittent basis generally coinciding

with the inhalation and exhalation periods of the patient, and proportioning said flows, so as to obtain proportional flows of said gas to the patient and into said chamber concurrently during the inhalation period and a venting of said supply of gas and said chamber concurrently to an initial pressure during the exhalation period, and



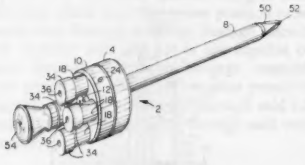
D. gauging the increase of pressure over said initial pressure in said chamber during each inhalation period so as to obtain a measurement of the tidal volume provided to the patient during each inhalation period.

4,112,932

LAPAROSCOPIC CANNULA

Robert D. Chiulli, 71 Cherry St., Somerville, Mass. 02143

Filed Feb. 24, 1977, Ser. No. 771,519
Int. Cl.[2] A61B *1/00, 17/36*
U.S. Cl. 128—3 **9 Claims**



1. A cannula comprising a base member having a bore therethrough, a tubular member aligned with said bore and extending outwardly from a first side of said base member, a turret member connected to a second side of said base member, said turret member having first and second apertures therein alignable individually with said bore, said turret member being movable relative to said base member to place a selected one of said apertures in alignment with said bore, said turret member being further movable to place said selected aperture out of alignment with said bore.

4,112,933

LARYNGOSCOPE OF THE STRAIGHT BLADE TYPE

John A. Moses, 30 Kalan Cir., Fairfield, Conn. 06430

Filed Jan. 21, 1977, Ser. No. 761,371
Int. Cl.[2] A61B *1/06*
U.S. Cl. 128—11 **10 Claims**

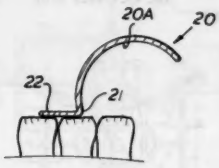
1. A laryngoscope blade comprising:

an essentially straight portion having an end portion adapted to extend into the throat beneath the epiglottis,

said straight portion being generally arcuate in cross section,

a flange connected to one edge of said arcuate cross section, said flange being substantially co-extensive to a longitudinal edge of said straight portion,

and said flange being turned laterally outwardly relative to the curvature of said arcuate cross section whereby the cross sectional arcuate curvature extends to one side of said flange,



said flange extending laterally of said arcuate cross section an amount sufficient to rest on more than one tooth so as to distribute the pressure thereover, and said flange extending generally along an extension of a radius of said cross section.

4,112,934

COMBINATION ALVEOLAR RIDGE PROTECTOR AND ANESTHETIC ADMINISTRATION AID

Samy F. Rizk, 1601-18 Third Ave., New York, N.Y. 10028

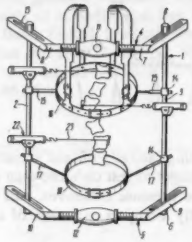
Filed Jun. 16, 1977, Ser. No. 807,253
Int. Cl.[2] A61B *1/00*
U.S. Cl. 128—12 **14 Claims**

1. An apparatus for use in preventing damage to the alveolar ridge during surgery and for facilitating anesthetic administration, said apparatus comprising a protective member and a handle member, said protective member including means being constructed and arranged to straddle said alveolar ridge in a manner to avoid contact therewith and to avoid contact with protuberances therefrom and including first and second means, said first means being constructed and arranged for receiving force directed toward said alveolar ridge applied to said protective member and said second means being itself constructed and arranged and being constructed and arranged relative to said first means to direct said force received by said first means away from said alveolar ridge, said handle member including manipulation means constructed and arranged for permitting the application of force to said protective member through a connecting means, said connecting means being located between said protective member and said handle member and cooperating therewith and being constructed and arranged relative thereto for permitting force applied to said manipulating means to be transmitted to said protective member.

4,112,935
APPARATUS FOR SURGICAL TREATMENT OF SCOLIOSIS

Anvar Latypovich Latypov, ulitsa Shmidta, 37, kv. 33, and Vakif Barievich Abrarov, ulitsa Polevaya, 32, kv. 4, both of Kazan, U.S.S.R.

Filed Nov. 3, 1976, Ser. No. 738,467
Int. Cl.² A61F 5/01
U.S. Cl. 128—69 **12 Claims**

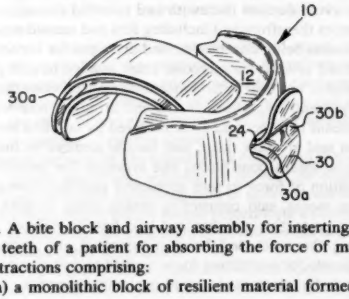


1. Apparatus for the surgical treatment of scoliosis, comprising: belt means to be strapped onto a patient's body, frame means to be situated at the exterior of the patient's body adjacent said belt means, said frame means including upper and lower yokes and upright strut means extending vertically between and fixed with said yokes, said strut means including at least one pair of upright struts for extending along both sides of the patient's trunk approximately in alignment with the spinal column, a plurality of stay rods respectively having inner ends operatively connected with said belt means and extending from said belt means outwardly toward the region of said strut means, adjustable connecting means adjustably connecting said stay rods with said strut means, flexible brace means to be secured to selected vertebrae while extending therefrom to the exterior of the patient's body, dynamometer means situated at the exterior of the patient's body and operatively connected with said flexible brace means for applying a predetermined tension thereto, and adjustable connecting means adjustably connecting said dynamometer means to said strut means, so that through said flexible brace means a corrective force can be exerted on the vertebrae.

4,112,936
BITE BLOCK ASSEMBLY ADAPTED FOR ADJUSTABLE MOUNTING AND HOLDING OF ORAL AIRWAYS AND METHOD OF USING SAME

Paul H. Blachly, 3348 NW Skyline Blvd., Portland, Oreg. 97229

Filed Sep. 27, 1976, Ser. No. 726,944
Int. Cl.² A61M 16/00
U.S. Cl. 128—136 **2 Claims**



1. A bite block and airway assembly for inserting between the teeth of a patient for absorbing the force of mandibular contractions comprising:

(a) a monolithic block of resilient material formed in a U-shaped such that the exterior of the block is generally convex and the interior of the block is generally concave;

(b) respective upwardly and downwardly facing teeth-engaging surfaces vertically spaced from one another extending longitudinally along each of the two sides of the U-shaped block wherein said respective upwardly and downwardly facing teeth-engaging surfaces tilt toward one another in transverse cross section, tending to converge in a direction toward the exterior of said block, so as to define wedge-shaped resilient material means therebetween for effectively resisting and withstanding the force of said mandibular contractions and directing said force against the wedge-shaped means in a direction toward the interior of the block to retain the block against outward dislodgment from the teeth;

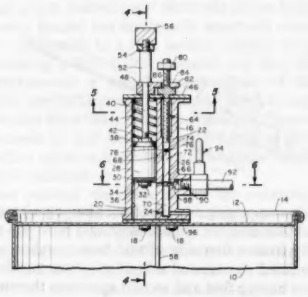
(c) means defining an aperture formed through a central portion of the U-shaped block which joins the two sides thereof together, said aperture extending between the exterior and interior of said block between the levels of said upwardly and downwardly facing teeth-engaging surfaces; and

(d) preformed, elongate, arcuate-shaped airway means slidably inserted through said aperture for conducting gas between the exterior and interior of said block while depressing the tongue of said patient, said airway means and aperture having mating surface means for frictionally and slidably engaging one another in any of a plurality of positions along the length of said airway means so as to permit slidable adjustment of said airway means with respect to said block.

4,112,937
GAS OPERATED RECIPROCATING CLEANING AGITATOR

Dick M. Hanning, 12092 Pine St., Los Alamitos, Calif. 90720

Filed Feb. 18, 1977, Ser. No. 769,878
Int. Cl.² B08B 3/04
U.S. Cl. 134—141 **1 Claim**



1. In a cleaning fluid agitator provided with a container having an interior fluid chamber, a lid for said container adapted to close said container and permit access into said fluid chamber and a cross-bar from which depends a pair of supporting rods that slidably extend through said lid and support a wire basket for supporting articles within said fluid chamber, an actuator to impart rapid reciprocating motion to said cross-bar, said actuator comprising:

a housing fixedly mounted upon said lid, a first chamber formed within said housing, a second chamber formed within said housing, said second chamber being spaced from said first chamber; and both of said first and second chambers are arranged in total isolation from said fluid chamber;

a piston reciprocably movably located in said first chamber and movable between a lower position and an upper posi-

tion, said piston having a piston rod that extends upwardly through said housing, with the upper end of said piston being attached to said cross-bar;

a coil spring located in said first chamber constantly biasing said piston towards said lower position;

an elongated valve member reciprocably movably located within said second chamber and divided into upper and lower lands by an annular groove and a transverse opening is defined within said upper land and is slightly crimped at both ends;

a collar on said piston rod that engages vertically spaced nuts on said valve member after a predetermined amount of vertical movement of said piston towards said lower and upper positions to cause said valve member to move in synchronism with said piston;

a pair of ball bearings carried by said valve member and which are carried in said transverse opening in said upper land and are spring biased into the wall of said second chamber and are allowed to protrude only slightly exteriorally of said upper land, thereby precisely and continuously centering said valve member within said second chamber while exerting only rolling frictional drag on said valve member as it reciprocates within said second chamber.

a gas inlet passage assembly formed in said housing extending between a pressurized gas source and said second chamber and said first chamber for admitting pressurized gas into the latter to effect upward movement of said piston;

a gas outlet passage assembly formed in said housing below said gas inlet passage assembly, said gas outlet passage assembly including a horizontal inner outlet passage connecting said first and second chambers and a horizontal outer outlet passage connecting said second chamber directly with the atmosphere, said inner outlet passage being substantially smaller in cross sectional area than the cross sectional area of said outer outlet passage;

a cup shaped flexible washer fastened to the lower extremity of said piston above said gas inlet passage and disposed to face downward within said first chamber to form a substantially air tight and low friction seal between said piston and said first chamber;

with said piston and said valve member being so configured that when said piston is in said lower position pressurized gas is conducted through said inlet passage assembly into said first chamber and said gas is not capable of being conducted through said outlet passage assembly, and when said piston is in said upper position pressurized gas is not capable of being conducted through said inlet passage assembly but is conductable through said outlet passage assembly.

4,112,938
DEVICE FOR CONTROLLING THE RESPIRATION IN RESPIRATORS

Stojan Jeretin, Ljubljana, Yugoslavia, assignor to Dragerwerk Aktiengesellschaft, Germany

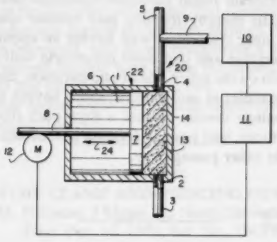
Filed Feb. 25, 1976, Ser. No. 661,275

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1975, 2507981

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—142 R **3 Claims**

1. A device for controlling the respiration through a person from a respirator in accordance with the partial pressure of CO_2 in the arterial blood or tissue measured in the alveolar expiration air, comprising a housing defining a chamber, a piston movably mounted in said housing for movement in one direction to expand the size of said chamber and in an opposite direction to reduce the size of said chamber, motor means connected to said piston to shift said piston to vary the size of said chamber, a first connection line adapted to be connected to said respirator and connected into said chamber from one side of said housing, a second connection line connected into said chamber from the opposite side of said housing and adapted to be connected to said respirator, sensor control means connected to said second connection line for sensing the partial CO_2 pressure therein and connected to said motor to



drive said motor to move said piston to vary the size of said chamber thereby, varying the partial pressure of CO_2 without changing the chosen minute volume of respiration and pressure.

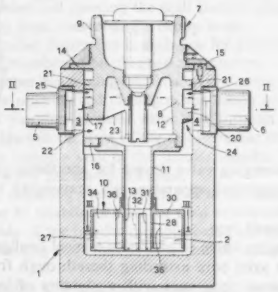
4,112,939
EVAPORATING MIXER FOR VOLATILE ANAESTHETICS

Matteo Visconti, Milan, Italy, assignor to Soxil S.p.A., Milan, Italy

Filed Dec. 21, 1976, Ser. No. 753,352

Int. Cl.[2] A61M *17/00*

U.S. Cl. 128—186 **2 Claims**



1. A mixing evaporator for anaesthetic products, comprising a vessel for containing in the lower portion thereof a liquid vaporizable anaesthetic product, said vessel having an inlet port formed through the upper portion thereof to permit the intake of a stream of a breathable gas and an outlet port formed through the upper portion thereof to permit the outflow of the same stream of a breathable product supplemented by an anaesthetic product in a variable proportion; means in said vessel defining two discrete passageways either of which directly connects the inlet port and outlet ports so as to convey breathable gas from the inlet port to the outlet port without addition of vaporizable product to the gas and the other of which connects these same ports and includes a deflected portion in communication with the lower portion of the vessel so as to contact and evaporate a portion of the vaporizable product in the lower portion of the vessel, said means including a rotatable body housed in said vessel, said rotatable body forming said passageways and cooperating with the wall of said vessel to throttle said passageways, said body including a depending vertical tubular portion extending into the lower portion of said vessel and terminating in a cylindrical body which is immersible in vaporizable anaesthetic product; said cylindrical

body including an inner tubular wall forming a chamber in communication with said depending tubular portion and an outer concertric tubular wall, said tubular walls defining an annular space which is closed at the top and open at the bottom, an imperforate radial partition connected between said concentric walls thereby forming said annular space into a passage, said inner concentric wall having an opening at one side of said partition and said outer concentric wall having an opening therein on the other side of said partition, and a plurality of radial paddles in said annular space having alternately arranged openings therein so that a flow path through said passage is tortuous, said passage forming part of said deflected portion of said other passageway.

4,112,940

SCAVENGING VALVE DEVICE

Alvin E. Parkes, Lewisburg, W. Va., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 25, 1977, Ser. No. 762,462
Int. Cl.[2] A61M *17/00*
U.S. Cl. 128—188 **2 Claims**

1. A scavenging valve device for anesthesia gas release in pediatric anesthesia apparatus, said scavenging valve device comprising

an anesthesia bag;

a scavenging valve of generally conical configuration having an axial bore extending therethrough from an open base to an open apex with a plurality of longitudinally extending fins around the bore in the valve, said scavenging valve having a plurality of external fin-like projections at its base, each of the fin-like projections having a hole formed therethrough for facilitating releasable affixing of the scavenging valve to an operating table to prevent shifting of said valve; and

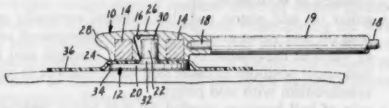
a control valve comprising a pair of nipples each of generally conical configuration in base to base relation with an axial bore extending therethrough from one open apex end to the other, the control valve having a radially extending hole formed therethrough at the juncture of the bases of the nipples, said bore tapering down to each of the apices from the bases, means for coupling one of said nipples at said control valve to said anesthesia bag and the other of said nipples within the scavenging valve, said control valve having a gas flow control and shutoff valve plate pivotally mounted in the bore thereof in the area of the bases of the control valve, a manually operable control member outside the control valve, and a pin extending through the hole through the control valve and coupling the control member to the valve plate in a manner whereby the valve plate rotates in correspondence with rotation of the control member.

4,112,941

ELECTRODE AND MAGNETIC CONNECTOR ASSEMBLY

Frank C. Larimore, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 6, 1977, Ser. No. 757,148
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.06 E **7 Claims**



1. An electrode-connector assembly comprising: an electrode comprising:

(1) a ferromagnetic electrode plate having an upper surface and a lower surface;

(2) an upstanding electrically conductive contact member firmly affixed to the upper surface of said electrode plate adapted to mate with the connector portion of said assembly;

(3) means for affixing the electrode plate to the surface of the skin with said contact member projecting away from the skin; and

(4) means for conducting electrical impulses between the skin and the electrode plate;

and a connector electrically and mechanically mated to said electrode, comprising:

(1) a magnet having an upper surface and a lower surface and side walls with a hole in said lower surface into which said upstanding contact member is releasably fitted so that said contact member electrically contacts said connector on some portion of said contact member and a space exists between said magnet and the upper surface of said electrode plate; and

(2) a lead wire electrically connected to said magnet.

4,112,942

METHOD OF PREPARING AND ADMINISTERING A FOAM ENEMA

Colin Scaife, Cottingham, England, assignor to Reckitt & Colman Products Limited, London, England

Division of Ser. No. 615,104, Sep. 19, 1975, Pat. No. 4,052,986. This application Jul. 29, 1977, Ser. No. 820,313
Claims priority, application United Kingdom, Oct. 9, 1974, 43787/74; Feb. 6, 1975, 5183/75
Int. Cl.[2] A61M *3/00*
U.S. Cl. 128—225 **8 Claims**

1. A method of preparing a foam enema for administration comprising the steps of:

(a) agitating an hermetically sealed container which is partially filled with a foamable substance to generate foam within the container;

(b) rupturing one end of said container and bringing a one-way air inlet valve into communication therewith; and

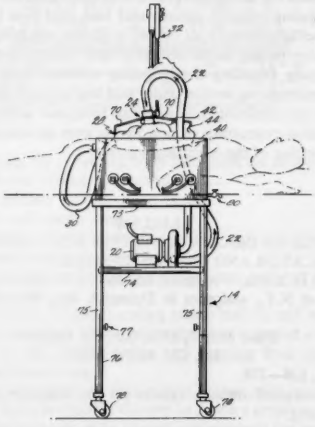
(c) rupturing the other end of the container to provide a discharge orifice.

4,112,943

THERAPEUTIC ASSEMBLY

Robbie J. Adams, Box 514A, Port Sulphur, La. 70083

Filed Mar. 26, 1975, Ser. No. 562,054
Int. Cl.[2] A61H *29/00*
U.S. Cl. 128—24.1 **11 Claims**



1. A portable assembly for heat-treating and massaging body parts comprising:

(a) a closed system for circulating heated liquid having momentum to any desired body part of a patient, said system comprising:

(i) A tank adapted to contain a volume of liquid therein,

(ii) a pump for circulating liquid in said system,

(iii) means for heating the liquid in said system,

(iv) a flexible bag member for transmitting the heat and momentum of liquid circulating through said system to a body part, said bag having an inlet and an outlet thereof, said outlet being larger than said inlet,

(v) first flexible hose means for circulating liquid from said pump to said bag inlet,

(vi) means for restricting a flow passage from said first flexible hose means to said bag at said bag inlet so that the velocity of liquid within said bag will be increased over the velocity within said first flexible hose, and the momentum thereof transferable through the walls of the bag increased, said means comprising a nozzle,

(vii) second flexible hose means for returning fluid from said bag outlet to said tank, and

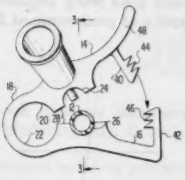
(b) carrier means for mounting said closed system for ready movement thereof.

4,112,944

TUBE CLAMP AND PIERCING DEVICE

Gayland M. Williams, 3 Maple St., North Springfield, Vt. 05150

Filed Dec. 13, 1976, Ser. No. 750,338
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 R **10 Claims**



1. A clamp and piercing device for securely clamping a tubular member and piercing the wall thereof, comprising:

two clamp jaws constituting a clamp body,

a semi-circular depression in each jaw for accommodating a tubular member to be clamped and pierced,

hinge member connecting each clamp jaw at one end thereof to allow opening and closing of the clamp jaws,

a hollow piercing member extending through one of the clamp jaws in the area of the semi-circular depression to thereby pierce a wall of the tubular member held in the clamp when the clamp is closed,

means for attaching a take-off conduit to the hollow piercing member to establish a path for fluid communication with the inside of the tubular member being clamped,

a pair of locking end tabs one at the end of each of the clamp jaws,

means flexibly and integrally connecting one end of at least one end tab to the end of the corresponding clamp jaw,

locking means in the form of locking rachet teeth facing each other on the end tabs arranged so that they can be locked together to secure the clamp jaws in clamping position or unlocked by flexing at least one of the end tabs away from the other to quickly and easily unlock the clamp, and

a finger contact portion on at least the flexibly connected end tab for finger contact for moving such end tab to unlock the rachet teeth locking means.

4,112,945

OPERATOR MEANS FOR SYRINGE CARTRIDGES

Michael L. Helixon, and Barry S. Ward, both of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Division of Ser. No. 650,248, Jan. 19, 1976. This application May 26, 1977, Ser. No. 800,864
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 D **6 Claims**

1. Operator means for use with a syringe cartridge having a barrel adapted to contain a quantity of fluid, discharge means on said barrel, and plunger means within said barrel and movable to effect fluid discharge from said barrel through said

discharge means; said operator means including cartridge holder means adapted to be mounted on said barrel adjacent said discharge end, said cartridge holder means having a plurality of arms extending longitudinally of said barrel, each of said arms defining a stop surface, said operator means further including plunger actuator means cooperable with said plunger means and movable to move said plunger means in a direction

to discharge fluid from said barrel, said actuator means having a plurality of stop surfaces thereon selectively engageable with said stop surfaces defined by said arms to limit movement of said actuator means in a direction to effect fluid discharge from said barrel, said stop surfaces on said actuator means and said stop surfaces on said arms being disposed to facilitate the discharge of a plurality of predetermined fluid dosages from said barrel.

4,112,946

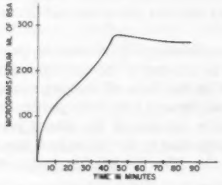
METHOD FOR THE TREATMENT OF WATER-LIVING ANIMALS WITH HEALTH MODIFYING AGENTS

Robert J. Herschler, 3080 NW. 8th St., Camas, Wash. 98607

Division of Ser. No. 657,228, Feb. 11, 1976, which is a continuation-in-part of Ser. No. 505,396, Sep. 12, 1974, abandoned. This application Dec. 2, 1976, Ser. No. 746,933

Int. Cl.[2] A61B *17/00*

U.S. Cl. 128—253 **13 Claims**



1. A process for the introduction of a health modifying agent into water-living animals comprising:

contacting a water-living animal body with a health modifying agent,

imposing a negative pressure differential on said animal body for a sufficient period of time to thereby expel the gas contained in said animal and thereby effect a substantial vacuum in the body structures and cavities of said animal, and while said animal is in contact with said agent, said negative pressure differential being insufficient to cause substantial injury to said animal,

rapidly relieving the negative pressure to bring the pressure up to at least ambient pressure,

thereby causing the animal body to accept by forced infiltration the agent in contact therewith at a plurality of locations on the animal body.

4,112,947

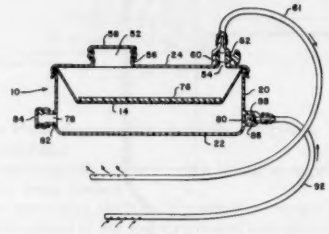
COMBINED IRRIGATOR AND EVACUATOR FOR CLOSED WOUNDS

John R. Nehring, Woodcliff Lake, N.J., assignor to International Paper Company, New York, N.Y.

Division of Ser. No. 618,482, Oct. 1, 1975. This application Jan. 24, 1977, Ser. No. 762,433

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—278 **10 Claims**



1. A combined irrigator and evacuator for use in bathing a wound with an irrigating solution and removing fluid from the wound, comprising:

(a) a rigid housing forming a chamber having opposed ends and a wall, at least one of said ends being substantially planar;

(b) means under bias for dividing said chamber into a pressure-irrigating section and a suction-evacuating section, said means being substantially planar and substantially parallel to said planar end;

(c) seal means for preventing fluid flow between said pressure-irrigating section and said suction-evacuating section;

(d) means for filling said pressure-irrigating section with said irrigating solution against said bias, said bias tending to expel substantially all of said irrigating solution; and

(e) flow means under selective rate control for simultaneously expelling the irrigating solution from the pressure-irrigating section under said bias towards said wound and for admitting fluid removed from said wound into the suction-evacuating section by vacuum developed by the expelling of the irrigating solution.

4,112,948

SURGICAL DRAINAGE SYSTEM WITH PRESSURE INDICATOR AND ENCLOSED SOURCE OF LIQUID

Leonard D. Kurtz, Woodmere, and Robert E. Bidwell, Melville, both of N.Y., assignors to Deknatel, Inc., Queens Village, N.Y.

Filed May 7, 1976, Ser. No. 684,315

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—276 **7 Claims**

1. A surgical drainage system for the drainage of a cavity comprising,

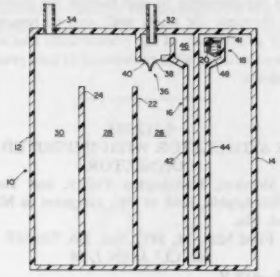
a collection chamber adapted to be in fluid communication with the cavity to be drained,

a compartment disposed adjacent said collection chamber, said compartment having a single opening therein,

a U-tube manometer placing said collection chamber in fluid communication with said compartment through said single opening in said compartment,

said U-tube manometer having first and second tubes in fluid communication at their lower ends so as to form a U shape, said collection chamber being in fluid communication with the upper end of said first tube, said compartment being in fluid communication with the upper end of said second tube of said U-tube manometer, the volume of

said manometer being small with respect to the volume of said compartment and,



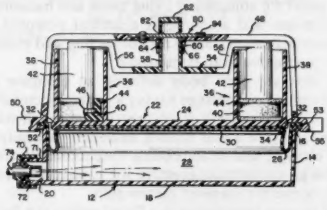
means for storing a liquid in fluid communication with said manometer, said storing means comprising a rupturable container located at the upper end of said second tube.

4,112,949

APPARATUS FOR COLLECTING BODY FLUID

Arthur Lee Rosenthal, Dover; Marvin Alpern, Glenridge, and Charles Edward Meisch, Jersey City, all of N.J., assignors to Howmedica Inc., New York, N.Y.

Filed Nov. 15, 1976, Ser. No. 741,733
Int. Cl.[2] A61M *1/00*
U.S. Cl. 128—278 **9 Claims**



1. Apparatus for collecting body fluid from the area of tissue behind a closed wound, comprising:

a. a substantially rigid housing having

(i) side wall means and

(ii) an end wall connected to said side wall means thereby to close one end of said housing;

b. piston means axially movable relative to said end wall;

c. sealing means;

d. means connecting said sealing means both to said housing and piston means for sealing a chamber bounded substantially by said piston means and housing from ambient pressure conditions;

e. means supported by said piston means, said supported means being actuatable thereby to create a pressure differential on opposite sides of said piston means for enabling said movement of said piston means relative to said end wall;

f. means for actuating said supported means whereby said movement of said piston means when said chamber is in substantially closed fluid connection with said area of tissue will create a negative pressure in said chamber to draw said body fluid from said tissue for collection in said chamber;

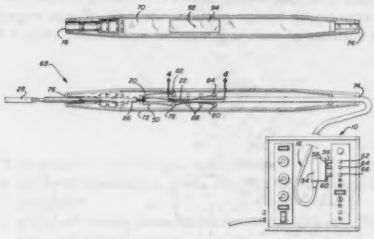
g. said supported means including at least one cylindrically walled member, said cylindrically walled member having an axis longitudinal of said axis of movement of said piston means with an end surface formed by a portion of the surface of said piston means, and a piston element adapted for movement away from said end surface for development of a partial vacuum therebelow.

4,112,950

MEDICAL ELECTRONIC APPARATUS AND COMPONENTS

Harold L. Pike, Littleton, Colo., assignor to Aspen Laboratories, Littleton, Colo.

Filed Oct. 22, 1976, Ser. No. 735,097
Int. Cl.[2] A61B *17/36*; A61N *3/02*
U.S. Cl. 128—303.14 **6 Claims**



1. Medical electronic apparatus comprising:

a generator for producing high frequency, high voltage current;

a therapeutic instrument including an electrode for applying the generated current to a patient;

and a compound electrical power and control cable connected to the generator, therapeutic instrument and electrode:

the cable including a first therapeutic current conductor component comprising a length of multiple strand bare conductor wire, including one strand of substantially heavier gauge than the other strands, and at least one second signal current conductor component comprising a length of single strand conductor wire provided with a film coating of low voltage insulating material;

the components being arranged in contacting parallel juxtaposition;

and a protective sheath of high voltage insulating material surrounding the components;

both components carrying current at high voltage with a relatively small voltage differential between them;

and switch means connected between the heavier gauge bare wire and the signal current conductor component wire to selectively connect the components electrically;

the film coating on the signal current conductor component wire having a higher insulating value than the voltage differential between the components;

and the protective sheath having a higher insulating value than the voltage applied to either the therapeutic current conductor component or the signal current conductor component.

4,112,951

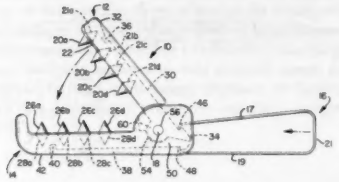
SURGICAL CLIP

Jaroslav Fabian Hulka, Chapel Hill, N.C., and George Selden Clemens, Northfield, Ill., assignors to Research Corporation, New York, N.Y.

Filed Jan. 26, 1976, Ser. No. 652,616
Int. Cl.[2] A61B *17/12*
U.S. Cl. 128—346 **5 Claims**

1. A surgical clip for occluding tubes in a living animal, said clip comprising first and second jaw members; means adjacent one end of each jaw member for pivotally mounting the other ends of said jaw members for movement toward each other to a closed position and away from each other to an open position; said pivotal mounting means including a pair of side

flanges at said one end of the first jaw member, an arcuate recess between said side flanges, a pivot pin receiving bore in said side flanges the axis of which lies on a radius of said arcuate recess, said one end of the second jaw member having a width to be snugly received between the pair of side flanges of said first jaw member, an arcuate bearing element on said second jaw member adapted to be received in the arcuate recess of the first member, a transverse pivot pin receiving bore in the arcuate bearing element, the axis of said pivot pin receiving bore lying on a radius of the bearing element and co-axial with the bores in the side flanges and a pivot pin in said bore in side flanges and the bore in the arcuate bearing element; a generally U-shaped spring member consisting of a pair of legs and a connecting bridge portion, the pair of legs engaging remote surfaces of each jaw member and slidable from a first



position on one side of the pivotal mounting to urge said jaw members into the open position to a second position on the other side of said pivotal mounting, to urge said jaw members into the closed position and, when the spring member is in the jaws closing position, the free end of each of the pair of legs of said U-shaped spring member having an inturned portion, a longitudinal U-shaped spring member receiving groove in each said first and second jaw members, said longitudinal groove terminating rearwardly of said pivot pin and forming with the inturned ends of the U-shaped spring stop members for the U-shaped spring when the spring is in said first position, the bridge portion thereof in conjunction with said side flanges carried by said first jaw member providing a smoothly contoured hinge end thereby reducing to a minimum zones for the entrapment of tissue which might be the cause of adhesions.

4,112,952

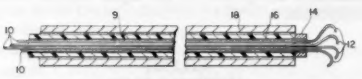
ELECTRODE FOR ARTIFICIAL PACEMAKER

George M. Thomas, Simpsonville; John W. Boretos, Rockville; Donald C. Syracuse, Bethesda, all of Md.; John A. Clark, Washington, D.C.; Anthony J. Vita, Mt. Airy, and Vincent A. Gaudiani, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of Health, Education and Welfare, Washington, D.C.

Filed Feb. 11, 1977, Ser. No. 767,996

Int. Cl.[2] A61N *1/04*

U.S. Cl. 128—418 **5 Claims**



1. An electrode for implantation in the myocardium to control atrio-ventricular block by artificial pacemaker comprising:

a plurality of resilient electrically conductive thin tempered wires grouped in coextensive, parallel relationship to form a bundle, means proximate one end of said bundle to fix said wires rotationally with respect to one another, the ends of said wires proximate said means being deformed to described arcuate segments radiating about the axis of said bundle to form prongs in the same direction and adapted to penetrate the pericardium to be implanted in the myocardium of the heart, insulation surrounding said bundle between said means and the ends of said wires remote from said means; and

constraining means associated with said prongs to compress them to the diameter of said bundle for insertion of said prongs through the chest wall and to remotely release them for penetration of the pericardium and implantation in the myocardium after movement of said prongs into the pericardium.

4,112,953

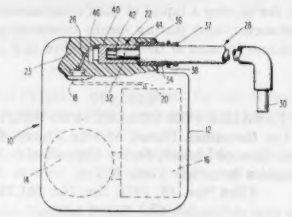
PACER STIMULATOR WITH IMPROVED LEAD CONNECTOR

Irvin Paul Shanker, Huntingdon Valley, and Teodozij Tryciecky, Philadelphia, both of Pa., assignors to Medcor, Inc., Hollywood, Fla.

Filed Mar. 11, 1977, Ser. No. 776,567

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 P **5 Claims**



1. In a pacer for stimulating living tissue and including pulse generator means and a source of electrical potential for the pulse generating means, means for connecting said pulse generator to a conductive lead, comprising:

(a) an elongate rigid body defining an elongate passage therewithin, said passage having a generally circular cross section and extending at least partway through said body;

(b) a plurality of metal strands extending helically within said passage, said strands being longitudinally stressed to define an expandable aperture for resiliently receiving a male connector member therewithin;

(c) said passage terminating in a flared orifice at a first end of said rigid body;

(d) a neck member extending from a second end of said body opposite said first end and having a size smaller than said body;

(e) a terminal member extending from the neck member and having a size larger than the neck member;

(f) conductor means for electrically coupling said terminal member to said pulse generator means so that the pulses produced by said pulse generating means are conducted through the terminal member to the conductive lead; and,

(g) a mass of hardenable non-conductive material molded about said elongate body, neck member, and said terminal member, whereby said terminal and neck member cooperate to resist withdrawal of said body from said mass of hardenable material.

4,112,954

TESTING OF CIGARETTES

Edward George Preston, and Eryk Stefan Doerman, both of London, England, assignors to Molins Limited, England

Filed Aug. 27, 1976, Ser. No. 718,371

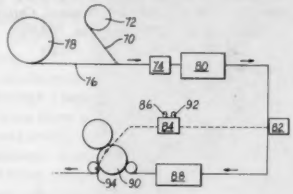
Claims priority, application United Kingdom, Aug. 28, 1975, 35479/75; Nov. 27, 1975, 48902/75

Int. Cl.[2] A24B *7/14*; A24C *5/32*

U.S. Cl. 131—21 R **16 Claims**

1. A machine for making filer-tipped cigarettes and for testing the wrappers of the cigarettes to detect any which allow an excessive leakage of air into the interior of the ciga-

rette from the atmosphere, comprising means for feeding pieces of tipping paper each of which is wrapped around associated tobacco and filter portions to join those portions to one another; means for testing the wrappers of the cigarettes for leaks; an upsetting device for momentarily upsetting the filter



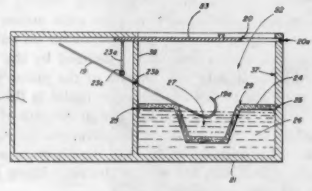
tipping operation to produce at least one cigarette with a deliberate leak in the joint between the tobacco and filter portions; and an ejection device arranged automatically to eject the deliberately faulty cigarette or cigarettes regardless of whether or not the wrapper tester detects the deliberately faulty cigarettes.

4,112,955

COIN OPERATED ULTRASONIC CLEANING DEVICE

Richard M. Gollel, 1148 Vroom Rd., Spencerport, N.Y. 14559

Filed Jan. 21, 1977, Ser. No. 761,305
Int. Cl.[2] B08B *3/04, 3/12*
U.S. Cl. 134—57 R **1 Claim**



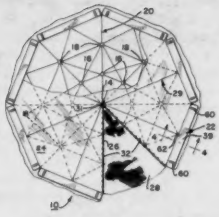
1. A coin operated ultrasonic cleaning device comprising:
a. a cleaning chamber for holding a cleaning liquid, said chamber having a bottom and vertical walls;
b. a cover for said chamber;
c. a coin controlled electromagnetic latch for locking and unlocking said cover;
d. a material receiving basket attached to the walls of said chamber;
e. a hook connected to the cover for lowering and raising the workpiece to be cleaned into and out of said basket, said hook being lowered into the basket when the cover is closed and being raised from the basket when the cover is opened; and
f. a source of ultrasonic vibrations positioned adjacent to the cleaning chamber; wherein the cover is slidably mounted at the upper end of the cleaning chamber, an actuating arm is positioned on the underside of the cover and attached thereto, and said hook extends through the wall of the cleaning chamber and is pivotably attached thereto whereby the straight portion of the hook is in communication with the actuating arm outside of the cleaning chamber and the curved portion of the hook is movably positionable inside of the cleaning chamber responsive to the position of said cover.

4,112,956

SHELTER CONSTRUCTION AND METHOD OF ASSEMBLING SAME

William H. Small, 7256 S. Coles, Chicago, Ill. 60649

Filed Nov. 22, 1976, Ser. No. 743,874
Int. Cl.[2] A45F *1/12, 1/16*
U.S. Cl. 135—1 D **11 Claims**



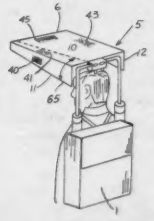
1. A shelter construction, comprising:
a series of upstanding posts adapted to be secured in the ground;
a group of tensile lines interconnecting directly the upper portions of said posts;
a single thin flexible sheet of imperforate material overlying and at least partially being supported from below by said group of tensile lines, said sheet being untensioned and resting on top of said posts and said tensile lines;
fastening means for fixing the periphery of said sheet to the ground; and
securing means for holding down loosely said sheet to confine the sheet in place over said tensile lines and the top portions of the posts.

4,112,957

SUN-SHIELD FOR BACKPACKERS

Earl U. Biven, 6352 Sierra Elena Rd., Irvine, Calif. 92664

Continuation of Ser. No. 586,304, Jun. 12, 1975, abandoned.
This application Dec. 8, 1976, Ser. No. 748,661
Int. Cl.[2] A45B *11/02*
U.S. Cl. 135—5 C **2 Claims**



1. A sun-shield assembly adapted for shielding a back-packer from sunlight and adapted for connection to each of a plurality of back-pack frames of non-uniform structure, the combination comprising:
a. a canopy having an opaque member of substantially fixed dimensions and adapted to be suspended in spaced relation above and forward of a back-packer's head; said canopy assembly also having a rod-like frame having a rectangular portion along substantially the entire perimeter of said opaque member and support-rods extending from said rectangular portion in a direction substantially perpendicular to said opaque member at locations adapted to be on the rear-most horizontal edge of said opaque member;
b. adaptor means for connecting said sun-shield assembly to any one of said plurality of back-pack frames;

c. extender means providing a pair of angle members, each such member having first and second portions substantially perpendicular to each other, the first portion of each such angle member being connected to said adaptor means for extending the height of said back-pack frames; and

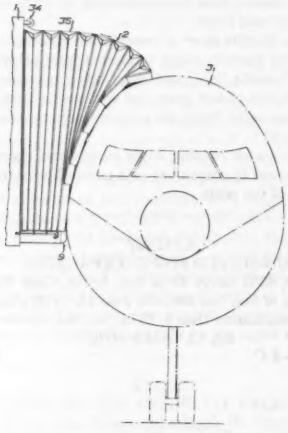
d. coupling means providing vertically extending slots slideably receiving said support-rods and also providing horizontally extending slots, the longitudinal axes of which are parallel to said rear edge of said opaque member, slideably receiving the second portions of said angle members, thereby coupling said support-rods of said canopy assembly frame to said extender means, whereby the distance between said second portions of said respective angle members may be varied while the distance between the support rods remains fixed.

4,112,958

CANOPY DEVICE

Nils-Eric Anderberg, Lund, Sweden, assignor to Fabriksmontering i Trelleborg AB, Trelleborg, Sweden

Filed May 6, 1977, Ser. No. 794,616
Claims priority, application Sweden, May 11, 1976, 7605337
Int. Cl.[2] B65G *11/14*
U.S. Cl. 135—5 A **6 Claims**



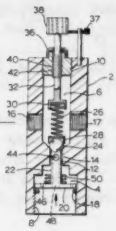
1. A canopy device intended to be connected between two through-openings which are orientable into alignment with one another and located each in one body the first one of which carries the canopy device and includes the first opening which is generally vertical, and the second body is a craft of varying shape and includes the second opening, said canopy device having a front portion which is movable into engagement with the craft to provide a weatherproof passage between the openings, said canopy device comprising: a collapsible and extensible bellows cloth having its rear edge secured to the two sides and the top part of the first opening; a series of generally U-shaped guide and support ribs which are attached to the cloth for guiding and bracing it and are mounted for pivotal movement at their bottom ends; and a retracting and extending means; the ribs disposed most remotely from said first opening being so arranged that the outermost rib is connected throughout its length with the front top edge of the cloth and, at the free ends of its side parts, is attached, for pivotal movement, to the respective side part of the next rib at a distance from the free end of this rib, said distance defining the lower portions of said side parts, said next rib and at least the immediately following rib being interconnected in the same way; wherein protective pads are attached to the top and side parts of the outermost rib and to the lower parts of the next ribs, at the sides of said parts facing the craft, and wherein, when the canopy device is being extended, the outermost rib with associated pads pivots in forward-downward direction due to gravity, whereupon the next ribs with their pads will follow successively into engagement with the craft.

4,112,959

ADJUSTABLE CHECK VALVE

Gunter R. Jaekel, 44 Coral Gable Dr., Weston, Ontario, Canada

Filed Apr. 22, 1977, Ser. No. 789,992
Int. Cl.[2] F16K *31/363, 15/04*
U.S. Cl. 137—504 **4 Claims**



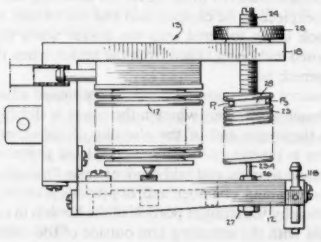
1. A check valve comprising a valve housing having an inlet and an outlet, a valve seating in the housing defining a passage between inlet and outlet chambers defined in said housing, a ball valve seatable on the seating on the outlet side thereof, a compression spring urging the ball onto the seat, a spring abutment adjustably mounted in the housing, the spring acting between the ball and the abutment to apply an adjustable bias to said ball tending to retain it on said valve seat, a cylinder defined in the housing between the inlet and the valve seat, a piston having a path of movement in said cylinder and having a stem extending into and substantially closing the passage defined by the valve seating, leakage path means placing in communication the portions of the cylinder on either side of the piston, and passageway means defined by the piston and extending from an inlet on the side of the piston nearest the inlet through the stem to at least one outlet in the side of the stem and so positioned that at one end of the path of movement of the piston the outlet is within the passage in the valve seating and at the other end of the travel of the piston is on the outlet side of the valve seat, the end of the stem being engageable with the ball valve member.

4,112,960

VARIABLE-GRADIENT SPRING SUB-ASSEMBLY

Henry M. Hermanns, Huntingdon Valley, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Mar. 21, 1977, Ser. No. 779,511
Int. Cl.[2] G05B *11/44*
U.S. Cl. 137—85 **4 Claims**



1. In a feedback assembly for a pneumatic transmitter, said assembly having a fixed arm on which a pressure-responsive

bellows is mounted to actuate a pivoted feedback arm that is caused thereby to swing downwardly in accordance with the applied pressure, a range spring sub-assembly for biasing said feedback arm and affording an adjustable variable gradient with minimum hysteresis, said sub-assembly comprising:

A. a helical spring bridging said arms, the lower end of said spring being secured to said feedback arm;

B. a span-adjustment screw terminating in an enlarged coupling head received in the upper end of said spring, the diameter of the head being substantially the same as the internal diameter of the helical spring, the screw extending through a bore in said fixed arm, said head having a set of at least three equi-spaced outwardly-projecting pins at different levels, each pin being interposed between a pair of adjacent spring convolutions, the difference in the levels being compatible with the helix angle of said spring, the convolutions entrapped by said pins being rendered inactive, the convolutions therebelow remaining active, the number of active convolutions being varied by rotation of said screw; and

C. a zero-adjustment knob threadably mounted on the screw portion projecting beyond the fixed arm and resting on this arm whereby rotation of the knob causes an axial shift of said screw.

4,112,961

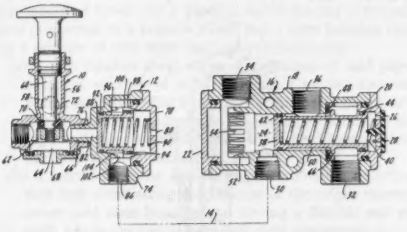
TRACTOR PROTECTION VALVE

Charles Horowitz, Niles, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Continuation-in-part of Ser. No. 651,410, Jan. 22, 1976, Pat. No. 4,019,525. This application Jun. 30, 1976, Ser. No. 701,086

Int. Cl.[2] B60T *15/36*

U.S. Cl. 137—102 **9 Claims**



1. Tractor protection valve means including a first housing having a chamber, tractor and trailer control ports and an exhaust port opening into said chamber, a piston movable in said chamber, spring means urging said piston to a position closing communication between said tractor and trailer ports,

tractor and trailer supply ports in said housing in communication through said chamber, air pressure at said tractor supply port moving said piston to a position opening communication between said tractor and trailer control ports,

a second housing separate from said first housing and having a chamber, an inlet port, exhaust port and a delivery port opening into said chamber, conduit means connecting said second housing delivery port and said first housing tractor supply port, a piston movable in said second housing chamber, spring means urging said second housing piston to a position opening communication between said second housing exhaust and delivery ports, air pressure at said second housing inlet moving said second housing piston to open communication between said second housing inlet and delivery port and to close communication with said second housing exhaust port.

4,112,962

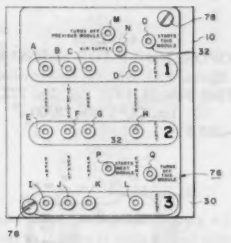
INTEGRATED PNEUMATIC LOGIC MODULE

Peter C. Huff, 6530 Dartbrook, Dallas, Tex. 75240

Filed Jan. 16, 1976, Ser. No. 649,646

Int. Cl.[2] F15B *13/07*

U.S. Cl. 137—119 **11 Claims**



10. A pneumatic logic control module comprising:

at least first and second valving means each having spool means shiftable between normal and active positions, and

pneumatic circuit means cooperating with the spool means for

shifting the first spool means from the normal position to the active position in response to a first pressure input signal to produce a first pressure output signal at a first outlet port which can be used to start a first event external to the module and for preventing a pressure signal from reaching a second outlet port, and

shifting the second spool means from the normal position to the active position in response to a first verification pressure input signal to shift the first valving means back to the normal position to terminate the first pressure output signal and to produce a second pressure signal at the second outlet port which can be used to start a second event external to the module.

4,112,963

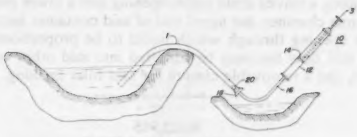
SIPHON TUBE STARTER

John M. Brubaker, Star Rte. Box 48, Hammett, Id. 83627

Filed Apr. 11, 1977, Ser. No. 786,375

Int. Cl.[2] F04F *10/00*

U.S. Cl. 137—148 **3 Claims**



1. A device for priming a siphon tube comprising:

a cylinder;

an externally operable piston longitudinally movable within said cylinder;

a piston rod connected at one end to said piston, said piston rod upwardly extending through an aperture of a cap securedly affixed to one end of said cylinder;

a handle connected to the other end of said piston rod;

a base portion sealingly engaging the other end of said cylinder;

an inlet tubular extension having one end mounted to said base and extending at substantially a right angle to the axis of said cylinder, said tubular extension having a fluid passageway therein, the passageway communicating with the interior of said cylinder; and

a flexible, substantially conical abutment means surrounding and concentric with said tubular extension and mounted to

said tubular extension with the apex of said abutment means adjacent the other, free, end of said tubular extension, said conical abutment means operable to sealingly engage one end of the siphon tube during retraction of said piston within said cylinder to create a negative pressure within the siphon tube and operable to release from the siphon tube in the absence of the negative pressure.

4,112,964

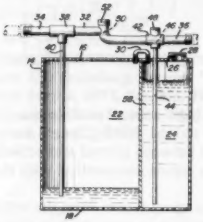
LIQUID PROPORTIONER FOR PRESSURE FEED LINE

Benjamin W. Banks, P.O. Box 92, Downsville, La. 71234

Filed Feb. 28, 1977, Ser. No. 772,814

Int. Cl.[2] F16K *19/00*

U.S. Cl. 137—205.5 **2 Claims**



1. A closed hollow pressure container, said container including means dividing the interior of said container into a pair of first and second closed compartments, gas transfer means communicating upper portions of said compartments for the transfer of gas under pressure from an upper portion of said first compartment into the upper portion of said second compartment, a liquid pressure flow line supported from said ocntainer in elevated position relative to the upper extremity of said container, said flow line including inlet and outlet end portions to which the discharge and inlet ends of supply and discharge lines, respectively, may be removably coupled, flow reducing means in said line intermediate its inlet and outlet end portions, a restrictive flow bleed line communicating said flowline, upstream from said flow reducing means, with the lower portion of the interior of said first compartment adjacent the bottom thereof and a proportioned liquid feed line communicating the lower portion of said second compartment with said flow line downstream from said flow reducing means, said second compartment being adapted to receive a liquid therein to be proportionally fed into said flow line, said container including a valved drain outlet opening into a lower portion of said one chamber, the upper end of said container including a filler opening through which liquid to be proportionally fed into said flow line may be admitted into said other compartment, and a removable closure for said filler opening.

4,112,965

SHUTOFF ELEMENT

Julius Kruschik, Gumpoldskirchen, Austria, assignor to Klinger AG, Zug, Switzerland

Filed May 11, 1977, Ser. No. 795,948

Claims priority, application Fed. Rep. of Germany, May 12, 1976, 2620905; May 12, 1976, 2620904

Int. Cl.[2] F16K *49/00*

U.S. Cl. 137—219 **10 Claims**

1. A shutoff element for a work medium comprising:

a substantially tubular-shaped outer housing;

an inner housing arranged within said outer housing;

substantially rib-shaped supports for connecting said inner housing with said outer housing;

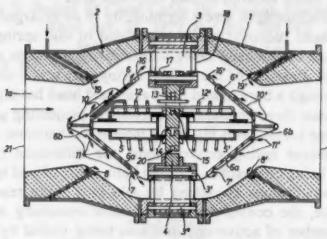
at least a first displaceable closure body arranged at said inner housing;

said inner housing including at least one double-acting work cylinder for displacing said closure body;

said inner housing and said closure body forming an inner body having an inner space in the open position of the shutoff element;

said double-acting work cylinder being arranged in the inner space of said inner body and carried by said inner housing;

said double-acting work cylinder having a free space about said work cylinder;



inlet means for a cooling medium opening into said free space;

means defining outlet opening means for the cooling medium in the direction of flow of the work medium;

said outlet opening means being formed by at least one substantially ring-shaped opening between the inner housing and a free end of the closure body.

4,112,966

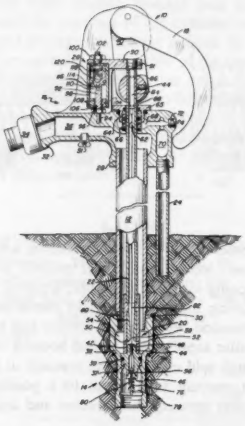
EJECTOR PURGE HYDRANT

Donald E. Carlson, Highland Park, Ill., assignor to Mark Controls Corporation, Lake Zurich, Ill.

Filed Nov. 29, 1976, Ser. No. 745,603

Int. Cl.[2] E03B *9/14*

U.S. Cl. 137—282 **14 Claims**



1. In a hydrant for controlling fluid flow from a fluid supply including

a housing having a lower portion connected to said supply and an upper portion;

means connected to said upper portion for delivery of fluid from said upper portion;

means for controlling fluid flow from said supply to said lower portion, said controlling means including a handle mounted on said hydrant and a main fluid supply valve connected to said handle, said handle being movable between a closed position and a fluid supply position, the improvement comprising

means for draining said housing of fluid remaining in said housing after termination of fluid flow, said draining means including a conduit within said housing and having an inlet adapted to communicate with said fluid supply and an outlet external to said housing, means establishing communication between the interior of said housing and said conduit, and valve means associated with said conduit inlet and movable from a closed to an open position upon movement of said handle from said fluid supply position to said closed position, whereby fluid remaining in said housing flows into said conduit and out of said outlet with fluid flowing through said valve means and said conduit, and means for automatically controlling the duration that said valve means is in said open position after said handle is moved to said closed position thereby controlling the duration of said draining of said housing by said draining means.

4,112,967

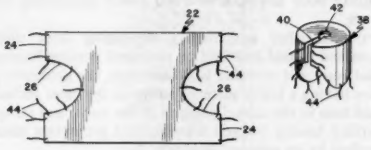
WEATHERPROOF INSULATED VALVE COVER

Ronald Withem, 4030 Payson Dr., La Mesa, Calif. 92041

Filed Dec. 29, 1976, Ser. No. 755,246

Int. Cl.[2] F16L *59/16*

U.S. Cl. 137—375 **3 Claims**



1. A removable, two-piece flexible, pre-fitted, water repellant insulated cover for a pipeline valve having a projecting stem connected to a control wheel and a stem housing enclosing a portion of said stem, said cover comprising:

(a) a first flexible sheet to cover portions of said pipeline adjacent said valve stem, said sheet having two edges which mate to define a cylinder around said pipe and said edges defining arcuate mating cutouts to define an opening for the protrusion of said valve stem housing through the cylinder defined by said sheet;

(b) a second separate flexible sheet removably attached to said first sheet along the cutouts in the edges thereof to cover said stem housing and having a flexible end piece with a hole therein to pass said stem therethrough;

(c) releasable twist wires provided in both sheets for fastening said second sheet to itself around said valve stem housing and to said first sheet and for fastening said first sheet to itself around said pipeline; and

(d) each of said sheets being multi-layered and having an insulating layer and a tough, inextensible, flexible, weatherproof, waterproof outer layer, whereby a pipeline valve may be effortlessly sealed from the elements by said valve cover and easily exposed for maintenance.

4,112,968

AUTOMATIC DRAIN VALVE FOR A COMPRESSED AIR SYSTEM

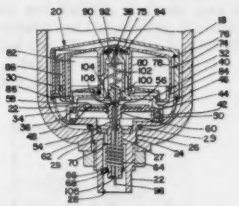
Robert K. Hoffman, Plainwell, and David C. Franson, Kalamazoo, both of Mich., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Division of Ser. No. 637,134, Dec. 3, 1975, abandoned. This application May 3, 1977, Ser. No. 793,472

Int. Cl.[2] F16K *33/00*

U.S. Cl. 137—427 **2 Claims**

1. A float for a liquid drain valve comprising an inverted cup member, said member having radially inner and outer sidewall portions, an upper wall portion and a lower wall portion, said portions defining an annular chamber for air, said upper wall portion being integrally attached to the upper ends of said sidewall portions whereby leakage of air from said chamber between said upper wall portion and said sidewall portions is



precluded, and said lower wall portion being a separate member that is attached to the lower ends of said sidewall portions, and said upper wall portion carrying a valve seat for cooperation with another portion of said drain valve.

4,112,969

REPLACEABLE ONE PIECE LINER FOR A GATE VALVE

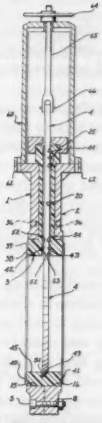
Robert C. Still, Tucson, Ariz., assignor to New Concepts, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 614,350, Sep. 17, 1975, Pat. No. 3,993,092. This application Nov. 22, 1976, Ser. No. 743,776

The portion of this patent subsequent to Nov. 23, 1993, has been disclaimed.

Int. Cl.[2] F16K *3/02*

U.S. Cl. 137—454.2 **8 Claims**



1. In a gate valve having a positionable gate with opposing surfaces disposed therein for regulating the flow of fluid intermediate an attached pair of pipes, the improvement comprising a pliant liner molded in one piece for receiving, guiding and seating the gate, said liner including:

a. a chest having a gate passageway with opposing sidewalls spaced from the opposing surfaces of the gate disposed therebetween;

b. a ring defining a bore and extending downwardly from said chest in general planar alignment therewith; and

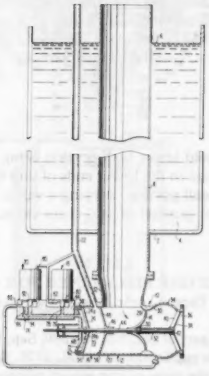
c. a depression disposed within said bore for defining a seat for the gate; whereby, said liner avoids the assembly and disassembly of segregable elements during replacement of the gate guiding, seating and sealing elements of the gate valve.

4,112,970

OSCILLATION DAMPING PRESSURE RELIEF VALVE

Morley V. Friedell, Rte. 1, Box 175, Stevensville, Mont. 59870

Filed Feb. 11, 1977, Ser. No. 767,928
Int. Cl.[2] F16K *31/363*
U.S. Cl. 137—489.5 8 Claims



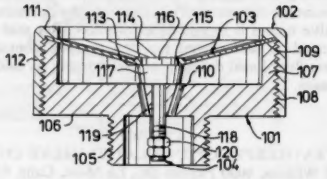
1. An oscillation damping pressure relief valve comprising:
a tubular main valve casing forming a main flow passage and having an inlet end open to a source of fluid under pressure,
means defining a circular valve seat within said main flow passage downstream of said inlet end,
a main valve poppet coaxially mounted within said flow passage casing for movement in the direction of fluid flow from said source and away from said valve seat from a first, closed position to a second, open position,
a poppet valve actuator piston operatively coupled to said valve poppet and fluid isolated from said main valve passage,
biasing means for normally biasing said valve poppet to said first, fully closed position in absence of fluid connection of said main valve casing to said pressure source,
casing means sealably and slidably supporting said actuator piston and defining first and second sealed chambers on opposite sides of said actuator piston and fluid isolated from said flow passage, said actuating piston having a larger effective surface area than that of said valve poppet,
means for continually subjecting said first chamber to said source pressure such that said actuator piston maintains said valve poppet at said first, fully closed position,
a primary pilot valve for connecting said second chamber to said fluid pressure source when said fluid pressure source reaches a predetermined value to balance the forces acting on said actuator piston and said valve poppet and permit the source pressure to overcome the biasing force of said biasing means to shift said poppet valve from said first, closed position towards said second, open position, and
means for venting a portion of the flow from the fluid pressure source through said primary pilot valve to said second chamber such that the fluid pressure slowly increases within the second chamber upon operation of the primary pilot valve and is maintained substantially below the fluid pressure within said first chamber.

4,112,971

SAFETY VALVE

Billy N. Nilson, Mjölby, Sweden, assignor to KeNova AB, Malmo, Sweden

Division of Ser. No. 564,080, Apr. 1, 1975, Pat. No. 4,061,254.
This application May 12, 1977, Ser. No. 796,167
Claims priority, application Sweden, Apr. 4, 1974, 7404749; Nov. 20, 1974, 7414566
Int. Cl.[2] F16K *31/12*
U.S. Cl. 137—508 7 Claims



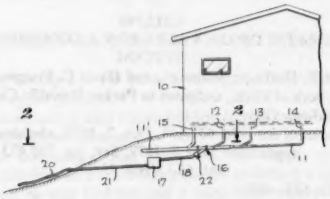
1. A self-resetting pressure release valve opening in response to a predetermined pressure and closing upon release of said pressure comprising:
a cuplike body having a base and a wall upstanding therefrom;
a valve member including a depending stem slidably mounted in said base and an abutment portion located in said body and movable with said stem, the abutment portion having a lower surface resting on the inner surface of said base in the closed position of the valve and an upper surface having thereon a cylindrical projection circumscribed by an annular shoulder;
an integral resilient annular diaphragm having a conical configuration when unstressed and passing through a substantially planar position under a predetermined pressure, said annular diaphragm having its outer periphery attached to said wall for positioning said diaphragm concavely in said body and having its inner periphery resting directly on said shoulder in the closed position of said valve, said body, diaphragm and abutment portion forming a cavity in said valve;
a plurality of passages through said base for applying fluid pressure to the lower surface of said abutment portion and into said cavity for stressing said diaphragm outwardly, said valve member being carried along with said diaphragm; and
means for separating said valve member from said diaphragm substantially at the planar position of the diaphragm, whereby said valve is opened.

4,112,972

WASTE WATER RECLAMATION APPARATUS

John B. Lajeuness, 3640 Virginia St., La Crescenta, Calif. 91214

Filed May 27, 1977, Ser. No. 801,036
Int. Cl.[2] E03B *3/00*
U.S. Cl. 137—597 6 Claims



1. A waste water reclamation system and apparatus comprising the combination of:

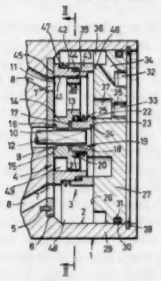
a plurality of household waste water sources;
a common conduit;
conduit means coupling with said waste water sources to said common conduit whereby gravity flow urges the waste water into and through said common conduit;
storage means for holding said waste water;
diverter means including a conduit interconnecting said common conduit with said storage means; and
a multiplicity of outlets coupled to said storage means for selectively distributing said waste water for predetermined purposes.

4,112,973

CONTROL ARRANGEMENT FOR A HYDROSTATIC AXIAL OR RADIAL PISTON MACHINE

Jürgen Klie, Sprockhovel, Fed. Rep. of Germany, assignor to G. Duesterloh GmbH, Sprockhoevel, Fed. Rep. of Germany

Filed Jul. 7, 1977, Ser. No. 813,492
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1976, 2630673
Int. Cl.² F16K *11/02*
U.S. Cl. 137—625.21 **12 Claims**



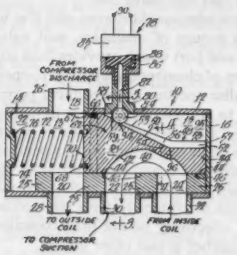
1. A control arrangement for a reversible hydrostatic piston machine, comprising housing means forming a planar control face and an opposite planar support face axially spaced from said control face; a machine shaft extending into said housing means coaxial therewith; a control body in said housing means between said control face and said support face and comprising an eccentric disk connected to said shaft for rotation therewith and having a peripheral surface and an inner and an outer control ring surrounding said peripheral surface of the eccentric disc and being telescopically guided in a sealed manner within each other, said control rings being hydraulically pressed apart in axial direction so that one of said control rings sealingly engages with one end face thereof said planar control face and the other of said control rings engages with an end face thereof said planar support face, said inner control ring having an inner surface in sliding contact with said peripheral surface of said eccentric disk, said eccentric disk being provided with fluid passages of relatively large cross-section therethrough and having a hub surrounding said shaft, said hub having an end face which is hydraulically pressed against said control face, said eccentric disk with the end face of the hub thereof engaging said control face forms together with said one sealing ring, the end face of which engages likewise said control face, an inner annular fluid guiding space which is sealed towards said shaft, said control rings forming between the outer peripheral surface thereof and said housing means an outer fluid guiding annular space; fluid guiding channels respectively communicating with said inner and said outer fluid guiding annular spaces; a sealing body connected to said shaft for rotation therewith but axially movable relative to said eccentric disk, said sealing body having an annular sealing face abutting against said support face; and spring means between said sealing body and said eccentric disk for urging said end face of said hub against said control face, with a predetermined minimum force irrespective of the presence or absence of hydraulic pressure.

4,112,974

REVERSING VALVE

Gerald L. Davis, and Timothy C. Scott, both of Bristol, Va., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 29, 1976, Ser. No. 736,878
Int. Cl.² F16K *31/04, 31/52*
U.S. Cl. 137—625.29 **10 Claims**



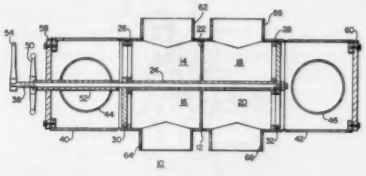
10. A flow control valve having a body with a chamber having a face and a plurality of ports at said face communicating with said chamber, a valve member having a surface engaging said face of the valve body and having a flow passage at said surface movable between two positions to vary the connection of said flow passage to said ports, means urging said valve member to one of said positions, a cam surface on said valve member at a side thereof opposite said surface, a reciprocable plunger operatively engageable with said cam surface, and means for exerting a force on the plunger having a magnitude sufficient to act on the cam surface and maintain said valve member and body in contact and a selectively greater force to extend the plunger to act on said cam surface and impart a component of force on said valve member in a direction to move the valve member against said urging means.

4,112,975

VALVING APPARATUS

Michael Csanady, Jr., Ridley Park, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar., 1977, Ser. No. 774,725
Int. Cl.² F16K *11/02*
U.S. Cl. 137—625.29 **7 Claims**



1. A valving apparatus comprising:
a housing;
a plurality of discrete chambers within said housing, said chambers including a first and second group each of which comprises at least two of said chambers, each said chamber having a transfer opening;
an inlet port for providing fluid communication to each chamber in said first group;
an outlet port for providing fluid communication to each chamber in said second group; and
means for regulating fluid communication through said inlet and outlet ports to selected chambers in said first and

second groups respectively, said regulating means comprising:

a rotatable shaft extending through said first and second groups of chambers, said shaft having a first end which is threaded and a second end;

a first valve disc having at least one aperture, said first valve disc being fixedly mounted on the second end of said shaft;

a second valve disc having at least one aperture, said second valve disc being disposed on said shaft so as to be rotatably fixed to the shaft and axially displaceable on the shaft, said second valve disc being disposed between said threads and said first valve disc;

a first valve seat interposed between said first valve disc and one of said groups of chambers, said valve seat being disposed in said port which provides fluid communication to that group of chambers, adapted to cooperate with said first valve disc aperture to selectively permit fluid communication to at least one chamber in that group;

a second valve seat interposed between said second valve disc and the other said group of chambers, said valve seat being disposed in said port which provides fluid communication to said other group of chambers, said valve seat being adapted to cooperate with said second valve disc aperture to selectively permit fluid communication to at least one chamber in said other group;

means for rotating said shaft;

a threaded handwheel engaged with said shaft threads in such manner as to seat said valve discs against said valve seats when said threaded handwheel is axially advanced toward said second valve disc and unseats both of said valve discs from said valve seats when said threaded handwheel is axially withdrawn from said second valve disc; and

means for precluding fluid communication interruption through said valve disc apertures and said valve seats during rotation of said shaft.

4,112,976

IMPROVEMENTS IN OR RELATING TO CONTROLS FOR HYDRAULIC VALVES

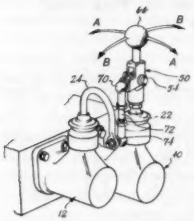
Angelo Sala, Latina, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Jan. 21, 1977, Ser. No. 761,143

Claims priority, application United Kingdom, Jan. 22, 1976, 02443/76

Int. Cl.[2] G05G 9/04

U.S. Cl. 137—636.2 **12 Claims**



11. A single lever control for first and second control valves each having spools reciprocal within a housing for the valves, comprising:

an elongate first arm and opposing first and second ends on said first arm first end pivoted on the first valve spool;

a universal joint on said first arm between said first and second ends thereon pivotally supporting said first arm on the valve housing;

a handle pivotally mounted on said first arm second end for pivoting said first arm about said universal joint to stroke the first valve spool;

a second arm and first and second ends on said second arm, said second arm first end pivoted on the second valve spool;

a second universal joint on said second arm between said second arm first and second ends pivotally supporting said second arm, said first and second universal joints pivoting said first and second arms about parallel axes when said arms actuate the valve spools, said axes being spaced apart longitudinally of the valve housings; and

means operatively connecting said second arm and said handle for actuation of the second valve spool only when said handle is pivoted relative to said first arm and said first arm actuating the first valve spool only when said handle pivots said first arm.

4,112,977

VORTEX DIODES

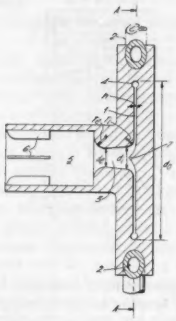
Nicholas Syred; John Grant, and Baldip Singh Sidhu, all of United Kingdom Atomic Energy Authority II Charles II St., London, England (SW1)

Filed Jun. 13, 1977, Ser. No. 805,917

Claims priority, application United Kingdom, Jun. 22, 1976, 25974/76

Int. Cl.[2] F15C 1/16

U.S. Cl. 137—812 **6 Claims**



1. A vortex diode comprising a thin cylindrical vortex chamber, a peripheral channel about the chamber, an axial port and at least one tangential port in communication with the chamber, characterized by the following geometric parameters:

(a) the diameter d_t of at least one tangential port at the region of merger thereof with the channel is substantially equal to the diameter of the channel;

(b) the ratio r_t/d_t, where r_t and d_t are, respectively, the radius of curvature at the junction of a tangential port with the vortex chamber and the diameter of the tangential port at its region of merger with the chamber, lies in the range 0.5 to 2;

(c) the ratio r_i/d_i, where r_i and d_i are, respectively, the radius of curvature at the junction between the axial port and the vortex chamber and the diameter of the axial port at its region of merger with the vortex chamber, lies in the range 0.3 to 3;

(d) the ratio r_e/d_e, where r_e and d_e are, respectively, the radius of curvature at the junction between the axial port with a flow passage at the end of the axial port remote from the chamber and the diameter of the axial port at its end remote from the chamber, lies in the range 0.3 to 4;

(e) the ratio A_i/A_e, where A_i and A_e are, respectively, the cross-sectional areas of the axial and tangential ports at the regions of merger with the chamber, lies in the range 0.5 to 2;

(f) the ratio h/d_e, where h is the internal height of the chamber, ranges from 0.1 to 0.5; and

(g) the ratio d_o/d_e, where d_o is the overall diameter of the chamber, ranges from 4 to 10.

4,112,978

VALVE FOR AN OPENING OF A PRESSURE VESSEL

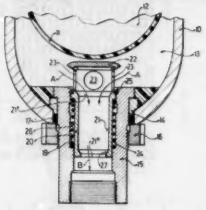
Gottfried Olbrich, Bietigheim, and Wilhelm Weigert, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 17, 1977, Ser. No. 797,794

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1976, 2634945

Int. Cl.² F16L 55/04

U.S. Cl. 138—30 15 Claims



1. A pressure device comprising a hollow vessel having an outlet for discharging fluid therefrom, said outlet being provided with a valve seat; a valve member slidably mounted in said vessel above said valve seat for movement between an open position in which it permits fluid to discharge through said outlet and a closed position in which it prevents fluid from discharging through said outlet, said valve member being provided with a portion facing towards and corresponding to said valve seat and operative for fittingly engaging said valve seat when the valve member is in said closed position, said fluid exerting during its flow through said outlet a component of force upon said portion which tends to prematurely force said valve member into said closed position; resilient means for urging the valve member into said open position; and means for accelerating the discharge of said fluid through said outlet of said vessel in said open position, to thereby prevent premature movement of said valve member into said closed position under the action of said fluid.

4,112,979

END CAP FOR PIPES

Derek Gordon Widdicombe, Huddersfield, England, assignor to Naylor Brothers (Clayware) Limited, England

Continuation of Ser. No. 544,893, Jan. 28, 1975, Pat. No. 3,963,268. This application Mar. 29, 1976, Ser. No. 671,599

Claims priority, application United Kingdom, Jan. 31, 1974, 4552/74

The portion of the term of this patent subsequent to Jun. 15, 1993, has been disclaimed.

Int. Cl.² F16L 55/10

U.S. Cl. 138—89 8 Claims

1. An end cap for a pipe, comprising

a tubular sleeve of synthetic material having opposite first and second ends,

said sleeve being closed at said first end by a wall extending transversely across the sleeve and being open at said opposite second end,

said sleeve at said second end having a plurality of spaced tongues extending substantially parallel to the axis of the sleeve,

each tongue being formed with a projection which extends therebeyond,

each projection also extending transversely to the corresponding tongue in a radial direction with respect to the longitudinal axis of the sleeve,

a clamping ring having a body formed with spaced through apertures in which the tongues are adapted to extend,

said apertures being wide enough in a radial direction relative to the longitudinal axis of the sleeve for the clamping ring to be push-fitted on the tongues by movement of the clamping ring towards said second end of the sleeve during which the projections enter the apertures first,

said clamping ring having a face portion facing away from said sleeve,

each projection having a face portion facing towards the first end of the sleeve and abutting against said face portion of said clamping ring,

said abutting face portions being in substantially the same plane and extending substantially perpendicular to the longitudinal axis of the sleeve whereby movement of the clamping ring along the said axis in a direction away from the sleeve is prevented,

said second end of said sleeve and said clamping ring defining between them an annular recess,

and a sealing ring of rubber-like material clamped in said annular recess between said clamping ring and said second end of said sleeve,

said sealing ring comprising a collar and an annular beading attached to the collar and extending around an inside of the sleeve for engaging an end of a pipe inserted into the sleeve through said second end of said sleeve.

4,112,980

LOOM HARNESS

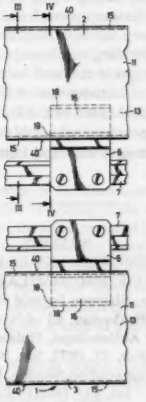
Hartmann Bader, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 1, 1977, Ser. No. 783,960

Claims priority, application Switzerland, Apr. 8, 1976, 4421/76; Feb. 15, 1977, 1836/77; Feb. 15, 1977, 1837/77

Int. Cl.² D03C 9/06

U.S. Cl. 139—92 11 Claims



1. A loom harness including a harness frame adapted for to-and-fro movement comprising:

a pair of spaced longitudinal beams defining top and bottom rails;

a pair of transverse beams defining side struts for said top and bottom rails;

at least one holder element carried by one of the longitudinal beams for mounting thereat a member;

at least one elastic intermediate element means interposed between the holder element and said one longitudinal beam carrying said holder element for transmitting tensile and compressive force flux between the holder element and said one longitudinal beam during the to-and-fro movement of the harness frame.

4,112,981

DEVICE FOR FEEDING PILE WARP YARNS FOR PILE FABRIC LOOMS

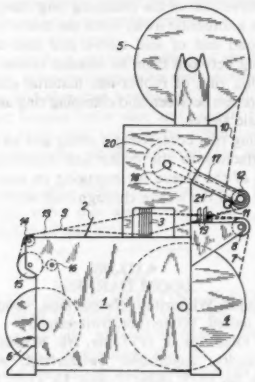
Erhard Freisler, Bubikon, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Dec. 15, 1976, Ser. No. 750,874

Claims priority, application Switzerland, Jan. 20, 1976, 623/76

Int. Cl.² D03C *49/06;* D03D *39/22*

U.S. Cl. 139—102 **4 Claims**



1. Device for the feeding of pile warp yarns for looms for weaving pile fabrics, having a pile warp beam, a feed roll, for the pulling of the pile warp yarns from the pile warp beam and guiding the pile warp yarns, arranged between the pile warp beam and a shed-forming mechanism, said feed roll simultaneously serving as guide roll and being arranged directly in front of the place of introduction of the pile warp yarns into the shed-forming mechanism of the loom and being supported by a common support arm which is swingable about a pivot mounted on the loom frame and adjustable to at least two positions of swing.

4,112,982

FORMING WIRE FOR USE IN PAPER-MAKING, CELLULOSE AND SIMILAR MACHINES

Hans Jörgen Bugge, Slattum; Ingvald Strandly, Oslo, and Carl Olof Swanberg, Bekkestua, all of Norway, assignors to Nordiska Maskinfilt Aktiebolaget, Halmstad, Sweden

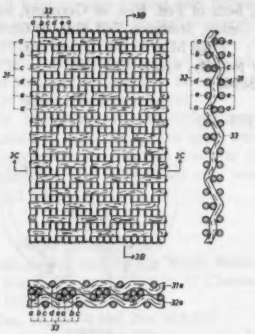
Filed Feb. 17, 1977, Ser. No. 769,779

Claims priority, application Sweden, Feb. 24, 1976, 7602211

Int. Cl.² D03D *15/02*

U.S. Cl. 139—425 A **9 Claims**

1. An improved forming wire for use in paper-making, cellulose and similar machines, comprising a first layer of weft threads facing the material formed on the wire, a second layer of weft threads facing the machine drive rollers, and synthetic warp threads interweaving said two layers of weft threads, the improvement comprising said first layer of weft threads cross-



ing said warp threads on the outer face of said wire closest to the material to be formed, in at least 80% of all cross points.

4,112,983

PICKING BANDS AND DRIVE ARRANGEMENT FOR GRIPPER WEAVING MACHINE

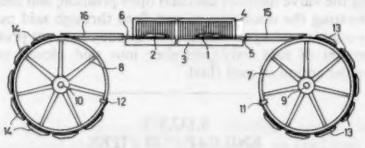
Fredy Oderbolz, Tann-Ruti, and Paul Bebie, Wolfhausen, both of Switzerland, assignors to Ruti Machinery Works Ltd, Ruti, ZH, Switzerland

Filed Jun. 28, 1977, Ser. No. 810,855

Claims priority, application Switzerland, Jul. 8, 1976, 8741/76

Int. Cl.² D03D *47/18*

U.S. Cl. 139—446 **5 Claims**



1. A gripper weaving machine having flexible weft picking bands for inserting weft threads into a weaving shed, each of said picking bands being secured at one end to a driving wheel positioned on a drive shaft capable of being driven in an oscillating manner during the operation of the weaving machine and having a gripper head secured to the other end of said picking band, the said picking bands being formed from a plastics material reinforced with carbon fibers so as to maintain the required flexibility and strength of the plastic bands during their continual oscillating in the weaving operation.

4,112,984

CAPPED FUEL TANK FUNNEL

Gaston Guglia, 10,227 de la Roche St., Montreal, and Jacques Lupien, 744 Camille St., Fabreville (Laval), both of Canada

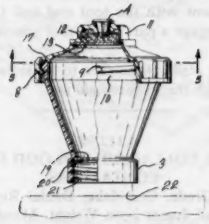
Filed Jul. 26, 1977, Ser. No. 819,611

Int. Cl.² B65B *39/04;* B67C *11/02*

U.S. Cl. 141—98 **1 Claim**

1. A funnel for attachment to the externally threaded neck of the filling opening of the fuel tank of an engine-operated machine, such as a lawn-mower, snowblower or the like, such funnel comprising a funnel body, made of molded plastic and having a large circumference upper end and a small circumference lower end, said lower end being provided with an integrally formed first cylindrical extension having internal threads and a sealing gasket for fluid-tight detachably securing said funnel body onto the externally threaded cylindrical neck

of the fuel tank filling opening, said upper end being provided with an integral second cylindrical extension having external threads, a detachable cap provided with a depending cylindrical skirt having a sealing gasket and internal threads complementary to the threads of said second cylindrical extension for fluid-tight and detachable connection of said cap to said funnel body, said cap having a central round top projection forming an upper external surface and having a tapered air inlet hole, said projection having buttons at its top external surface closely surrounding said hole, an air inlet hole plug having a tapered body fitted within said hole having a hat-shape top forming a rigidly protruding flange resting on said buttons and



maintained spaced from said top external surface, said tapered body being provided with a slit permitting air intake into said funnel body, said plug body being further provided with a lip at its inner smaller diameter end engaging the inner surface of said projection and maintaining said air inlet plug in position within said tapered hole, said plug allowing air to enter within said funnel body while substantially excluding water from entrance within said funnel body, an air filter, of open-cell foam, located within said projection below said plug and a perforated wafer located at the base of said projection below said air filter supporting the same and preventing upwardly splashing fuel from reaching said air filter.

4,112,985

HYDRAULIC LOG SPLITTER IMPLEMENT

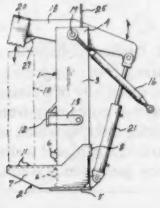
Yvon Gosselin, 11e rang, R.R. 1, Plessisville, Canada

Filed Mar. 18, 1977, Ser. No. 779,420

Claims priority, application United Kingdom, Mar. 22, 1976, 11367/76

Int. Cl.[2] B27L *7/00*

U.S. Cl. 144—193 A **1 Claim**



1. A hydraulic log splitter implement comprising an elongated upstanding body portion, a pair of connectors secured at upwardly spaced-apart positions along said upstanding body portion and pivotally securable to a three-point hitch system of a farm tractor, a log support carried by said body portion, a splitting wedge movably carried by said upstanding body portion for movement toward and away from said log support, power means to cause movement of said splitting wedge, said wedge defining a thin edge directed toward said log support for splitting engagement of said splitting wedge into the upper end of a log positioned upright on said log support, said log support being upwardly adjustable along said upstanding body portion to a selected height below the splitting wedge in relation to the length of the logs to be split and wherein said upstanding body portion has a rectangular or square cross-section substantially uniform along its lower part, adjustment teeth serially spaced apart upwardly along a face of said lower part, and said log support includes a top substantially horizontal plate having an edge selectively resting on one of said adjusting teeth, and a collar member secured to said top plate, surrounding said body portion and including a collar part slidably engaging a second face of said lower part opposite to said first-named face, said collar part being at a higher level than said top plate and the latter being held in cantilever fashion on said body portion by said collar part and by said edge of said top plate.

4,112,986

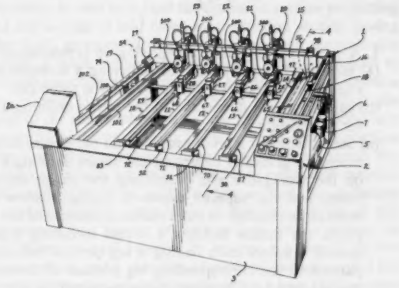
AUTOMATIC DADOING MACHINE

Delbert D. Strange, and Ronald M. Hunts, both of San Diego, Calif., assignors to Manufacturing Approaches & Total Concepts, Inc., San Diego, Calif.

Division of Ser. No. 600,726, Jul. 31, 1975, Pat. No. 4,005,738. This application Sep. 30, 1976, Ser. No. 728,405

Int. Cl.[2] B27C *5/02*

U.S. Cl. 144—323 **4 Claims**



1. A method for automatically cutting grooves in sheet material with routers having downwardly extending cutting bits, said method comprising the steps of:

a. supporting the sheet material upon a plurality of continuously parallel maintained rails;

b. locating each of the plurality of rails in vertical alignment with the bit of one of the routers to provide support beneath each bit for the sheet material;

c. gripping one edge of the sheet material with a plurality of first clamps mounted upon a common shaft and each first clamp being mounted adjacent and movable with each rail;

d. clamping another edge of the sheet material with a plurality of second clamps extending from and movable with each rail to maintain the sheet material adjacent the plurality of rails and biased toward the plurality of first clamps;

e. actuating the plurality of second clamps by a first plurality of input controls to secure the sheet material in place;

f. identifying the number and length of the grooves to be cut in the sheet material by a second plurality of input controls;

g. translating the bit of each router with first drive means along and vertically upwardly displaced from the underlying one of the plurality of rails;

h. positioning the bottom of the bit of each router at a predetermined distance into and out of the plane of the sheet material with second drive means;

i. generating feedback signals with detection means indica-

tive of the location of the bits of the routers along the plurality of rails; and

j. energizing the first and second drive means with control means responsive to the first and second plurality of input controls and the feedback signals generated by the detection means to form grooves in the sheet material through vertical positioning and horizontal translation of the bits of the routers.

4,112,987

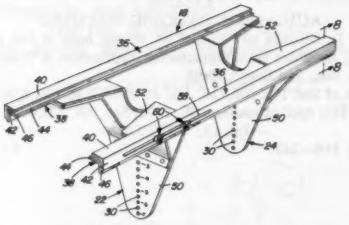
RADIUS ROUTER GUIDE

Ben E. Pachnik, P.O. Box 107, Sparks, Nev. 89431

Filed Nov. 17, 1976, Ser. No. 742,456

Int. Cl.[2] B27C *5/10*

U.S. Cl. 144—323 **9 Claims**



1. A radius router guide, comprising, in combination:

(a) means defining a recess for receiving a workpiece at an end of the workpiece where a radius is to be cut;

(b) support means connected to the means defining a recess for receiving a router; and

(c) means defining a pivot provided on the means defining a recess for pivotally mounting the means defining a recess on the workpiece and permitting the means defining a recess and the support means to swing relative to the workpiece in order to cut a radius at the end of the workpiece, the means defining a recess including a pair of spaced brackets each having a leg portion substantially parallel to the corresponding leg portion of the other of the brackets, the brackets being mounted on the router support means and disposed extending codirectionally therefrom for receiving the workpiece between the substantially parallel leg portions.

4,112,988

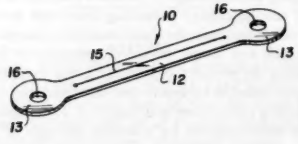
FASTENER HOLDING ATTACHMENT FOR A TOOL

Karl L. Nelson, 3870 Manitoba Ave., Powell River, British Columbia, Canada (V8A 2W4)

Filed Mar. 15, 1977, Ser. No. 777,707

Int. Cl.[2] B25B *15/00*

U.S. Cl. 145—50 D **4 Claims**



1. The combination of a tool and a fastener holder serving to start a fastener in a hard-to-reach location, said tool having a shank and a fastener-engaging part; said holder comprising a resilient member including an elongated centre portion and opposite end portions, said elongated centre portion having a longitudinal slot through which the fastener projects while engaged by the fastener-engaging part, said opposite end portions each being provided with an opening having a side edge, said side edges gripping the shank and being adjustable lengthwise thereof with the opposite end portions are overlapped above the fastener-engaging part and the resilient member wrapped around said part to allow the shank of the tool to project through the substantially aligned openings, and said centre portion then releasably retaining the fastener in engagement with the fastener-engagin part.

4. A method of releasably securing a fastener to a tool using a resilient member having a longitudinal slot and opposite end openings comprising the steps of:

forming the resilient member into a loop so that the longitudinal slot traverses an end of the tool to hold the fastener in engagement with the tool end and the opposite end openings engage a part of the tool remote from that end, and

tensioning the resilient member to resist passage of the fastener through the longitudinal slot.

4,112,989

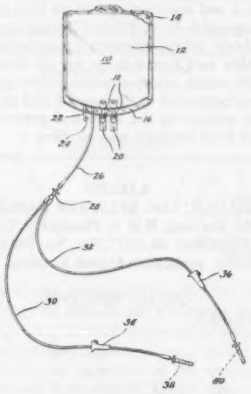
FLEXIBLE COLLAPSIBLE BLOOD FREEZING CONTAINERS

Gerald Arthur Grode, Grayslake; Daniel Roy Boggs, Round Lake Park, and James Irvin Wright, Mundelein, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 6, 1975, Ser. No. 629,347

Int. Cl.[2] A61M *5/14*

U.S. Cl. 150—1 **5 Claims**



1. An improved, flexible, collapsible container, having improved physical strength at cryogenic temperatures, defining walls which consist essentially of a biaxially-oriented ethylene-vinyl acetate copolymer containing from 10 to 35 percent by weight of vinyl acetate units, in which said walls have a thickness of from 0.01 to 0.025 inch, said walls being sealed together by a radio frequency generated seal to define said container.

4,112,990

ENVELOPE

Michael Denny Anderson, Meopham, England, assignor to Versapak International Limited, England

Filed Feb. 11, 1977, Ser. No. 768,014

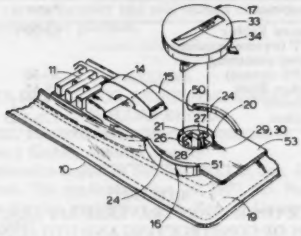
Claims priority, application United Kingdom, Feb. 18, 1976, 6380/76

Int. Cl.[2] B65D *55/06*

U.S. Cl. 150—3 **3 Claims**

1. A re-usable envelope having an opening, closure means for closing said opening, and sealing apparatus, the closure means including a locking part which is held in its closed

position by the sealing apparatus to seal the closure means closed, the sealing apparatus including two parts, an expendable part and a part mounted on said envelope to be retained for re-use, the expendable part being engageable with the retained part to close the sealing apparatus and being removable to open the sealing apparatus, the expendable part only being removable by being broken, deformed or otherwise damaged so as not to be re-usable, the two parts each having trap surface means to trap therebetween, when the two parts



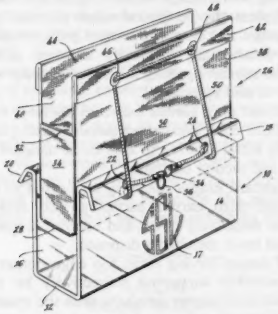
are engaged with one another, the locking part in its closed position, the locking part being shaped to include finger engagement means extending away from the sealing apparatus whereby the finger engagement means and an adjacent part of the envelope may be engaged between two fingers of one hand to hold together the locking part and the trap surface means of the retained part whilst fingers of the other hand engage the expendable part of the sealing apparatus with the retained part of the sealing apparatus.

4,112,991

CONVERTIBLE HANDBAG

Charlotte Barbaresi, Greenwich, Conn., assignor to Acricite Company, Inc., Bridgeport, Conn.

Filed Nov. 30, 1977, Ser. No. 855,830
Int. Cl.[2] A45C *13/00*
U.S. Cl. 150—28 A **4 Claims**



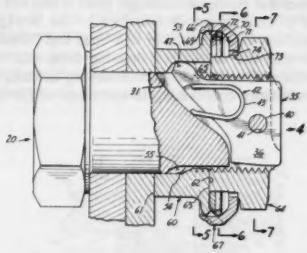
1. A convertible handbag which comprises: a relatively rigid basket member including first and second spaced side panels defining an opening therebetween; first and second elongated wing members depending, respectively, from said first and second side panels, adjacent said opening and extending outwardly therefrom; a bag supported within said basket defining a mouth positioned within said basket opening; first and second elongated flexible flaps extending from said bag on opposite sides of said mouth; and means associated with said flaps for interlocking with said first and second wing members.

4,112,992

SAFETY BOLT

George S. Wing, Palos Verdes Estates, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Jan. 19, 1977, Ser. No. 760,416
Int. Cl.[2] F16B *39/04*
U.S. Cl. 151—29 **5 Claims**



1. In combination: a safety bolt having an axis, a head, an axially extending solid shank with a diameter, and a retention section in that order, the safety bolt being installable in a hole in a workpiece, said workpiece having a face at each end of the hole, with the head against a first of said faces, the shank closely fitting in said hole, and the retention section projecting beyond the second of said faces, said retention section having an outer wall, an external thread, a slot opening through said outer wall, a latch member in said slot pivotally mounted to said retention section and movable to a first position wherein a portion of said latch member projects radially beyond the diameter of the shank whereby to bear against the second face to prevent the bolt from leaving the hole, and a second position wherein said portion lies within said diameter to permit the bolt to leave the hole, and bias means biasing the latch member toward said first position, said retention section also including notch means angularly spaced from the said portion of the latch means; a nut having an axis and an axial opening, an internal thread in said opening to engage the thread on the retention section, and a plurality of teeth extending around the axis; and an intermediate collar comprising a base ring proportioned to fit around said retention section and having an aperture and a finger in said aperture, said finger being proportioned and arranged to fit in said means to limit rotation of the base ring, sid base ring also having a plurality of engagement means around said axis, a locking ring having a plurality of engagement means to engage the engagement means on said base ring, and a plurality of teeth angularly selectively engageable with said teeth on the nut, said locking ring being axially shiftable, whereby to disengage said teeth to permit rotation of the nut in a first axial position of the locking ring and to engage them to prevent rotation of the nut in a second axial position of the locking ring, said engagement means always being engaged against relative rotation, and bias means biasing the locking ring toward said second axial position.

4,112,993

GROMMET ASSEMBLY

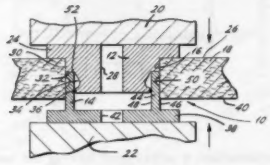
Ervin J. Dey, Santa Fe Springs, Calif., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Filed Apr. 26, 1977, Ser. No. 791,090
Int. Cl.[2] F16B *19/08*
U.S. Cl. 151—41.74 **6 Claims**

1. A grommet assembly comprising:
a first member including an enlarged head at one end thereof adapted to bear on one surface of a workpiece, a shank portion extending from said head and formed to be inserted into an opening in the workpiece from said one surface thereof, said shank portion including a segment having an outer periphery substantially conforming to the

shape of the opening, a tip portion at the other end of said first member having an outer periphery less than the opening, a recessed portion between said shank portion and said tip portion, said recessed portion having at least some part of its outer periphery less than the outer periphery of said tip portion, and a shoulder disposed between the outer periphery of said shank portion and said recessed portion; and

a second member having an enlarged head at one end thereof adapted to bear on another surface of the workpiece, a shank portion extending from said head and formed to be inserted into the workpiece opening from said another surface thereof, said shank portion having an outer periphery substantially conforming to the shape of the opening



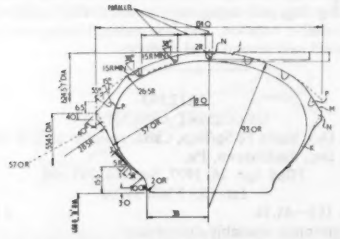
and an inner periphery greater than the first member tip portion outer periphery, an end portion at the other end of said second member, and a section of varying reduced thickness intermediate the ends of said second member shank portion varying from a maximum thickness adjacent each of said ends to a minimum thickness intermediate the ends of said reduced thickness section, said reduced thickness section being juxtaposed from and cooperating with said first member recessed portion to provide an interlock therebetween upon the application of opposing forces on said first and second members to form the grommet assembly, said first and second members each having a passageway extending therethrough, said passageways being in substantial alignment with each other when said first and second members are interlocked together.

4,112,994

PNEUMATIC TIRES HAVING LOW ASPECT RATIO

Anthony Mark Mills, and David Lyndon Buck, both of Sutton Coldfield, England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 392,209, Aug. 28, 1973, abandoned.
This application May 30, 1975, Ser. No. 582,365
Claims priority, application United Kingdom, Sep. 1, 1972, 40641/72
Int. Cl.[2] B60C *13/00, 17/00, 9/02*
U.S. Cl. 152—354 R **36 Claims**



1. A pneumatic tire having two bead regions, an aspect ratio of less than 65% and a rubber tread, having a profile rounded in cross-section, comprising a carcass of crossed plies extending from one bead region to the other and comprising cords which are placed in tension when the tire is inflated, the bias angle of each carcass ply being less than 22° with respect to the mid-circumferential plane of the tire, the width of the tread measured in a direction parallel to the axis of the tire between the edges thereof being the maximum width of the tire measured in said direction, the tread rubber having a resilience measured on a Dunlop Healey Pendulum at 50° C of the order of 50 to 55 and a hardness at room temperature of the order of 64° to 66° BS, and the tread rubber has the following composition:

Component	Parts
Natural Rubber	50–70
LTP (styrene butadiene rubber containing 23.5% styrene)	50–30
Carbon Black	55–65
Extender Oil	7.5–12.5
Sulphur	1.75–2.25

4,112,995

MULTIPLE OPERATION TRAVERSE APPARATUS AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Ralph R. Pasinski, 9204 Basset Ct. West, Livonia, Mich. 48150

Filed Apr. 4, 1977, Ser. No. 784,610
Int. Cl.[2] A47H *1/00*
U.S. Cl. 160—126 **7 Claims**

1. A traverse apparatus comprising:

at least one track member disposed substantially between a first position and a second position, said track member being disposed substantially horizontally adjacent and coextensive with a standard drapery rod to cooperate therewith;

a looped cord operably connected to said track member for selectively moving relative to said track member, said cord having a first drape supporting portion thereof disposed adjacent the peripheral edges of said horizontal track member and having a second pull portion thereof disposed substantially vertically adjacent said second position for selective pulling thereof in opposite directions by a user of said apparatus;

first, second and third carrier members operably connected to said looped cord, said carrier members being adapted to selectively move relative to said track member between said first and second positions;

a pair of standard drapes operably connected to said first, second and third carrier members, said drapes being adapted to selectively cover and uncover a space across which said track member is disposed;

said pair of drapes having three top edge corner portions thereof movably supported respectively by said first, second and third carrier members, with the remaining top edge portions of said pair of drapes being movably supported by said standard drapery rod;

said first, second and third carrier members being adapted to cooperate with said track member and said looped cord to selectively control said covering and uncovering of said space from said first position, and from said second position, and from a third position disposed between said first and second positions proximal the center portion of said track member;

said first carrier member and said second carrier member being adapted to support the two inner top edge corner portions of said pair of drapes, and said third carrier mem-

ber being adapted to support the outer top edge corner portion of said pair of drapes which is in closest proximity to said second position;

said first carrier member and said second carrier member being provided with interlocking means for permitting said first carrier member and said second carrier member to be interlocked for integral movement thereof relative to said track member; and

said third carrier member being adapted to remain stationary relative to said track member and adjacent said second position when said interlocking means provided on said first carrier member and said second carrier member is in an inoperative position.

4,112,996

SAFETY DEVICE FOR ARRESTING UNROLLING OF ROLLER BLINDS

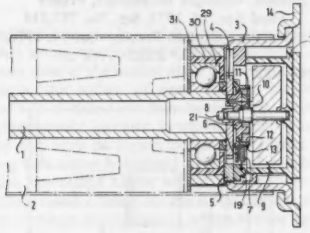
Artur Föhl, Haubersbronn, Germany, assignor to Repa Feinstanzwerk GmbH, Aldorf, Germany

Continuation-in-part of Ser. No. 692,275, Jun. 3, 1976, abandoned. This application Dec. 14, 1977, Ser. No. 860,300

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1975, 2524421

Int. Cl.[2] E06B *9/208*

U.S. Cl. 160—296 **5 Claims**



1. In a roller blind with a horizontally oriented winding shaft, a safety device for arresting unrolling of the blind in the event of failure of support means for the blind, which comprises a concentric blocking shaft affixed to the winding shaft to prevent rotation of the blocking shaft relative to the winding shaft, a gear rigidly fastened to the blocking shaft near its end, a pivotally mounted pawl with a spring urging the pawl in contact with the teeth of said gear, a gate member holding the pawl out of contact with the teeth of the gear during normal unrolling of the blind, an inertial member supported relatively movably with respect to the blocking shaft whereby when said roller blind is rolled down in normal operation said inertial member will not change its relative movement to the blocking shaft but with increased unrolling velocity said inertial member will change its relative movement to the blocking shaft and activate said gate member to permit the pawl to enter in contact with the teeth of said gear and arrest unrolling of the blind.

4,112,997

METAL CASTING

George D. Chandley, Amherst, N.H., assignor to Hitchiner Manufacturing Co., Inc., Milford, N.H.

Filed Feb. 28, 1977, Ser. No. 772,817

Int. Cl.[2] B22D *17/14*; B22C *9/08, 9/22*

U.S. Cl. 164—119 **3 Claims**

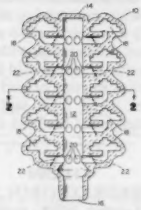
1. A method of casting a plurality of parts in a multiple cavity, gas permeable, shell mold, comprising the steps of

providing a mold with a central vertical riser passage having an open lower end and having a plurality of mold cavities connected to said riser passage by gate passages having screen means extending thereacross, said screen means extending across said gate passages in a slanted plane with the bottom portion thereof nearer to said mold cavities and at an angle of about 45° to 60° to the horizontal

lowering the open lower end of said mold beneath the surface of molten metal,

causing molten metal to fill said riser passage and said mold cavities through said gate passages and said stabilizing screen means therein and to filter out impurities, while gas in said cavities escapes through their walls

at least in part solidifying said molten metal around the periphery of said mold cavities and the portion of said gate passages between said stabilizing screen means and said mold cavities while maintaining said molten metal as a liquid in said riser passage and in the portion of said gate



passages between said stabilizing screen means and said riser passage and

draining molten metal from said riser passage and from the portion of said gate passages between said stabilizing screen means and said riser passage before complete solidification of said molten metal in said mold cavities, said stabilizing screen means stabilizing molten metal in said mold cavities and in the portion of said gate passages between said stabilizing screen means and said mold cavities during and subsequent to said drainage of molten metal from said riser passage and from the portion of said gate passages between said stabilizing screen means and said riser passage.

4,112,998

POURING METHOD AND APPARATUS THEREFOR

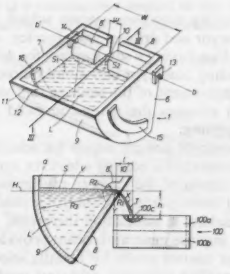
Jiro Sato, Nagoya, Japan, assignor to Fujiwa Kika Kabushiki Kaisha, Nagoya, Japan

Continuation-in-part of Ser. No. 646,037, Jan. 2, 1976, abandoned. This application Nov. 15, 1976, Ser. No. 741,843

Claims priority, application Japan, Oct. 22, 1975, 50-126302; Nov. 7, 1975, 50-150722[U]; May 10, 1976, 51-52152

Int. Cl.[2] B22D *37/00, 41/04*

U.S. Cl. 164—136 **11 Claims**



1. A method for pouring molten metal from a tiltable ladle into a mold; said ladle having a front wall, and a pouring outlet from which such molten metal is poured disposed in said front

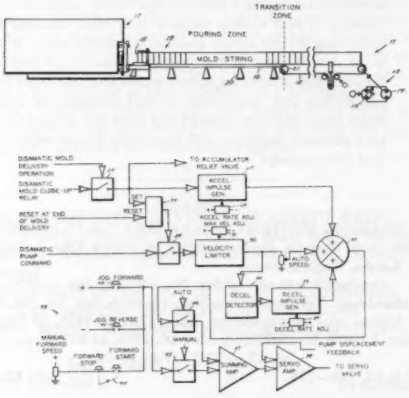
wall beneath the terminal edge thereof, said outlet having a bottom edge guide of arcuate sectional configuration for guiding the molten metal from the outlet in a constantly uniform stream into such mold; the extent of the arcuate shape of the molten metal guide being across the thickness of the front wall of the ladle such that the horizontal and vertical distances between the mold and the horizontal and vertical axes passing through the point at which the metal begins free fall remain substantially unchanged during all phases of pouring; the steps comprising tilting said tiltable ladle from a first position at a first velocity to a molten metal fall starting point at which molten metal begins to flow from said ladle outlet; continuing to tilt said ladle, without stopping, at a second velocity one-fortieth to one-one hundredth of said first velocity; said second tilting velocity being maintained constant; pouring a streamline of molten metal of consistent arcuate configuration between said ladle and mold while maintaining said second tilting velocity; said first velocity being reduced to said second velocity by means of a continuous deceleration within 0.5 second whereby undulation of the molten metal in said ladle is minimized; and tilting said ladle in the direction of said first position to terminate flow of molten metal from said ladle after a desired amount of such molten metal has been poured into such mold.

4,112,999

CONVEYOR CONTROL SYSTEM

Stephen A. Gasper, Lansing, Mich., assignor to Roberts Corporation, Lansing, Mich.

Filed Mar. 7, 1977, Ser. No. 775,164
Int. Cl.[2] B22C *19/04, 25/00*
U.S. Cl. 164—154 **5 Claims**



1. In a cooling conveyor system which includes a mold cooling conveyor and drive means therefor, and an automatic molding machine having a squeeze ram for delivering molds to the mold cooling conveyor and a mold close-up relay switch actuated by movement of the squeeze ram so as to generate a signal which actuates the automatic mold machine control system, comprising:

cooling conveyor control means for selectively controlling the movement of a cooling conveyor synchronously with the movement of the squeeze ram in response to signals received directly from the control system of the automatic mold machine in association therewith;

start track impulse generator means provided in said cooling conveyor control means for initially selectively accelerating the cooling conveyor, said start track impulse generator means actuated by a signal from the mold close-up relay switch activated by the squeeze ram of the automatic mold machine;

velocity limiter means provided in said cooling conveyor control means for selectively limiting the speed of the cooling conveyor to a point slightly slower than the maximum attempted velocity of the squeeze ram of the automatic mold machine;

deceleration impulse generator means provided in said cooling conveyor control means for selectively decelerating the cooling conveyor at a rate equal to or greater than that of the squeeze ram of the automatic mold machine, said deceleration impulse generator controlled by deceleration detector means which senses deceleration of the squeeze ram of the automatic mold machine; and

cooling conveyor drive means for selectively driving said cooling conveyor in response to signals from said cooling conveyor control means; and

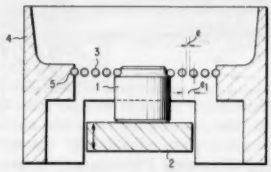
servo valve control means provided in association with said cooling conveyor control means and said cooling conveyor drive means for selectively controlling the speed of the cooling conveyor in selective response to signals received from said cooling conveyor control means, said start track impulse generator means, said velocity limiter means and said deceleration impulse generator means.

4,113,000

SELF-CLEANING EJECTOR-FILTER

Bernard Poisson, Paris, France, assignor to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed Apr. 14, 1977, Ser. No. 787,514
Claims priority, application France, Apr. 14, 1976, 76 10948
Int. Cl.[2] B22C *17/00*
U.S. Cl. 164—227 **7 Claims**



1. A combination device for filtering the air from an air-sand mixture or an air-liquid metal mixture in molds for sand cores and metal castings at the moment of filling these molds, as well as for ejecting the finished part, comprising:

a filtering element in the form of a spiral spring, the turns of which are non-touching, for obstructing an air-evacuation orifice,

an ejector element situated in said orifice such that the central part of the spiral spring is wrapped around an end of said ejector element so as to support said spiral spring and to oppose any sag in the spiral spring; and,

means for moving said ejector element in an upward and downward direction.

4,113,001

MOULD CLAMPING AND POSITIONING SYSTEM

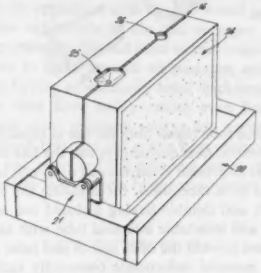
John Workman, Lough House, Greyabbey, County Down, Northern Ireland

Filed Nov. 22, 1976, Ser. No. 744,095
Claims priority, application United Kingdom, Nov. 21, 1975, 47914/75
Int. Cl.[2] B22D *27/16, 5/02*
U.S. Cl. 164—255 **2 Claims**

1. Moulding apparatus, comprising:

a mould box formed in two separate parts, the box parts being unitable at a mould parting face and each said part incorporating at opposite ends thereof a lug member having a substantially semi-circular outside profile, the arrangement being such that the mould box parts can be

abutted at the mould parting face and the lug members of one box part registered with the lug members of the other box part so that the substantially semi-circular surfaces of the adjacent lug members cooperate to form substantially circular lugs coaxially disposed at opposite ends of the mould box, said mould box also having casting and air-venting apertures located in one of the box sides, each of said apertures being intersected by said mould parting face and each being formed partly by each box part, and a mould box support structure incorporating a pair of spaced support members for receiving and supporting said



substantially circular lugs of said mould box, each support member having two parallel rollers respectively spaced on opposite sides of the medial plane conjoining said support members, the rollers of each support member being spaced by a distance less than the diameter of the pertaining substantially circular mould box lug, whereby the mould box may be supported on said rollers with the parting face either horizontal or vertical in which latter position the rollers of the mould box support structure provide a reaction force for the weight of the mould box and its contents during casting which biasses the two box parts together.

4,113,002

CHILL PREVENTING ARRANGEMENT FOR USE IN CENTRIFUGAL CASTING AND METHOD FOR PREVENTING CHILL THEREBY

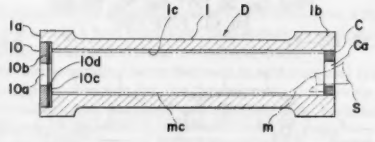
Shigemi Fukuta; Hiroshi Izaki, both of Osaka, and Shoichi Yoshino, Tondabayashi, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Aug. 5, 1976, Ser. No. 712,068

Claims priority, application Japan, Dec. 11, 1975, 50-148902

Int. Cl.² B22D *13/02, 13/10*

U.S. Cl. 164—286 **10 Claims**



1. A method for preventing chilling at an end portion of a uniform diameter tubular casting formed in a centrifugal casting mold including an end plate against a flat surface of which said end portion is formed, said method comprising:

forming a groove in said end plate surface and roughening the surface of said groove;

then forming an intermediate metal alloy layer in said groove by flame or plasma spraying a metal alloy material therein;

forming a ceramic coating of a thickness greater than 0.7 mm on said intermediate layer by flame or plasma spraying ceramic material thereon until said ceramic coating is exposed from said end plate surface; and

machining the exposed surface of said ceramic coating until it is smooth and flush with the inner surface of said end plate surface.

4,113,003

STARTER BAR HEAD ARRANGEMENT

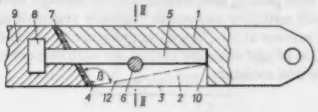
Stefan Biricz, Linz, Austria, assignor to Vereinigte Österreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Dec. 9, 1976, Ser. No. 749,119

Claims priority, application Austria, Dec. 12, 1975, 9448/75; Jun. 15, 1976, 4351/76

Int. Cl.² B22D *11/08*

U.S. Cl. 164—446 **9 Claims**



1. In a starter bar head arrangement to be used in continuous casting plants for strands with at least one strand anchoring piece protruding from the starter bar head at the front side thereof, a transverse bolt being provided for fixing the at least one strand anchoring piece, the starter bar head being connectable with the cast strand having a crop end by casting-on said at least one strand anchoring piece, an insulating layer being provided to cover the front face of the starter bar head, the improvement which comprises a recess provided in the starter bar head open towards the front face of the starter bar head, the at least one strand anchoring piece being inserted therein, and the at least one strand anchoring piece being automatically droppable after the removal of the transverse bolt and separation of the crop end, a certain portion of the at least one strand anchoring piece being inserted in said recess, said portion having such a cross-section that the distance between a forwardmost supporting place of the at least one strand anchoring piece on the starter bar head and an oppositely arranged limiting face of the at least one strand anchoring piece is, at most, equal to the shortest distance between a supporting place in the recess and an oppositely arranged wall of said recess.

4,113,004

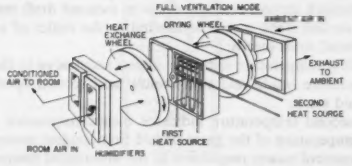
AIR CONDITIONING PROCESS

William F. Rush, Arlington Heights; Jaroslav Wurm, N. Riverside, and Raymond J. Dufour, Wheaton, all of Ill., assignors to Gas Developments Corporation, Chicago, Ill.

Continuation of Ser. No. 520,616, Nov. 4, 1974, Pat. No. 4,014,380, which is a continuation-in-part of Ser. No. 415,323, Nov. 13, 1973, Pat. No. 3,889,742. This application Nov. 3, 1976, Ser. No. 738,481

Int. Cl.² F23L *15/02;* **F24F** *3/14;* **F28D** *19/04*

U.S. Cl. 165—3 **10 Claims**



1. An open-cycle air conditioning process for heating and removing moisture from air having a single rotating wheel functioning as an enthalpy exchanger wherein treatment air to

be heated is passed through a treatment air passageway and a regenerative air stream is passed through a separate regenerative air passageway comprising the steps:

passing treatment air to be heated through a treatment air passageway over an enthalpy exchanger and transferring heat from the enthalpy exchanger to the treatment air stream to provide heated air having desired temperature; and

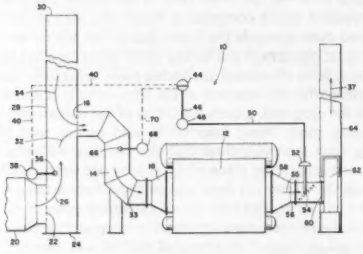
passing a regenerative air stream through a separate regenerative air passageway countercurrent to said treatment air stream, the entire regenerative air stream being heated by passing a low temperature heater means supplying heat to the entire regenerative air stream prior to said enthalpy exchanger, splitting said regenerative air stream into a first and a second portion, said first portion passing directly through a segment of said enthalpy exchanger to partially regenerate said segment and said second portion being further heated by passing a high temperature heater means and then passing said second portion through said segment of said enthalpy exchanger partially regenerated by said first portion at a sufficient temperature to complete regeneration of said enthalpy exchanger with respect to temperature and moisture.

4,113,005

WASTE HEAT BOILER TEMPERATURE CONTROL SYSTEM

Clifford J. Cantrell, Jr., Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Apr. 22, 1977, Ser. No. 789,939
Int. Cl.[2] F22D *1/16*
U.S. Cl. 165—40 **3 Claims**



1. In a thermal oxidizer stack system, including a first stack connected through a first opening near its base to the outlet of said thermal oxidizer, the hot products of combustion or stack gases passing up said stack, apparatus for recovery of the waste latent heat in said hot stack gases, comprising;

(a) heat exchanger means having an inlet and an outlet;

(b) sais inlet to said heat exchanger means connected by first conduit means through a second opening in the wall of said stack to the interior thereof, at a selected point intermediate the base and top of said stack, but always above said first opening;

(c) the outlet of said heat exchanger means connected through second conduit means to induced draft means;

(d) second stack means connected to the outlet of said induced draft means;

(e) first temperature indicator means responsive to the temperature inside said stack below said second opening in said stack;

(f) second temperature indicator means responsive to the temperature of the gases in said first conduit means; and

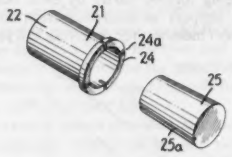
(g) control means responsive to the differential temperature indication of said first and second indicators to control the rate of flow of stack gases from said first stack through said heat exchanger means, to, and up said second stack means.

4,113,006

TWO-PIECE TUBE PLUG FOR REPAIRING TUBES IN HEAT EXCHANGERS AND THE LIKE

Porter B. Clapp, 8 Robin Hood La., New City, N.Y. 10956

Filed Jan. 31, 1977, Ser. No. 764,520
Int. Cl.[2] F28F *11/02*; F16L *55/10*
U.S. Cl. 165—76 **1 Claim**



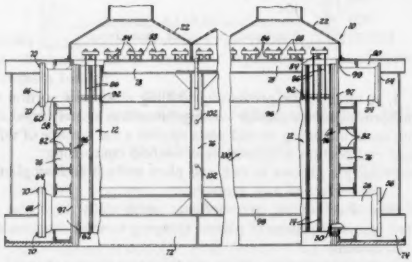
1. A two-piece tube repair plug for use in repairing damaged tubes in condensers, heat exchangers and the like comprising; a tubular thimble insertable in use into an open end of a damaged tube, mounted on a tube sheet, for isolating the tube sheet at the tube sheet; said thimble having a closed end and an opposite open end and insertable into said tube with said open end thereof disposed toward the open end of said tube; said thimble comprising a material deformable outwardly radially for engaging the interior of an end portion of said tube positively and closing it with a fluid-tight seal and comprising a tubular shell having a flange circumferentially of said open end thereof to limit the extent of axial entry into the open end of said tube a cylindrical plug insertable axially into said thimble through said open end thereof for deforming said thimble outwardly radially to effect said seal; and said plug being dimensioned to be received in said thimble and configured to deform said thimble outwardly radially; said thimble comprising a tapered bore converging in a direction toward said closed end thereof; said plug comprising a tapered cylinder converging toward one end thereof, the taper of said cylinder being different and lesser than the taper of said tapered bore, said plug being inserted in use with said one end thereof disposed for assembly with said thimble adjacent said closed end of said thimble; said plug comprising an axial recess on the periphery thereof along the full axial length of the plug to allow escape of air from internally of said thimble as said plug is inserted axially therein; and said flange having circumferentially spaced peripheral notches to allow said shell to deform outwardly radially.

4,113,007

RECUPERATOR

Robert J. Flower; Clarke R. Snedeker, both of Lockport, and Paul K. Beatenbough, Medina, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 20, 1977, Ser. No. 789,066
Int. Cl.[2] F28F *5/00*
U.S. Cl. 165—81 **5 Claims**



1. A rapid startup recuperative heat exchanger, including a

core with air and gas passages formed between spaced plate members which extend in substantial parallelism with one another; said plates of the core having openings therein aligned with one another along both sides of the core; guide rod means extending through said aligned openings in a generally horizontal direction and engaging said plates in a manner permitting sliding movement thereon while maintaining alignment of said plates; a frame including upper beam members extending substantially parallel to said guide rods; connecting means between said beam members and guide rods for supporting said core; insulative panels extending in closely spaced parallelism to the core sides in contact with the gas in said gas passages to form yieldable side walls of the gas passages; air inlet and outlet fittings joined to the end plate of said core for passage of pressurized air to and from said air passages; said fittings and said end plate having substantially equal thicknesses to reduced resistance to heat flow and promote even heating thereof during a rapid core warmup; means for preventing abrupt sectional changes between the active heat exchange members, such as said end plate and the adjacent series of plates, by a gradual reduction in thickness between adjacent plates.

4,113,008

APPARATUS FOR SEPARATING CLEANING ELEMENTS FROM A FLUID

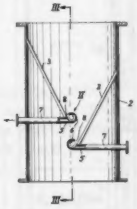
Friedrich-Wilhelm Treplin, Ratingen, and Werner Borchert, Ratingen-Tiefenbroich, both of Germany, assignors to Ludwig Taprogge, Reinigungsanlagen für Röhren-Wärmeaustauscher, Düsseldorf, Germany

Filed Mar. 25, 1977, Ser. No. 781,489

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612917

Int. Cl.² F28G *1/12*

U.S. Cl. 165—95 **8 Claims**



1. An apparatus for separating cleaning elements from a fluid stream traversing a heat exchanger, said apparatus comprising

a vertically disposed circular cylindrical duct;

at least one separating sieve disposed in said duct and lying in a plane inclined to the axis thereof, said sieve having an ellipsoidal upper boundary and a substantially horizontal lower boundary;

a diagonal collecting tube disposed along said lower boundary and formed with a longitudinally extending slit aligned with said lower boundary and receiving cleaning elements collected by said sieve, said slit extending over the entire lower boundary of said sieve and substantially the full length of said collecting tube, said slit being disposed so as to induce a tangential and swirling flow of the fluid axially, traversing said duct into said tube and entraining said cleaning elements from said sieve through said slit into said tube; and

a fitting connected to said tube for withdrawing said elements therefrom.

4,113,009

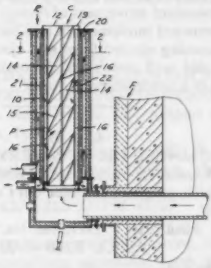
HEAT EXCHANGER CORE FOR RECUPERATOR

Robert W. Meyer, Novi, and George A. Hall, III, Westland, both of Mich., assignors to Holcroft & Company, Livonia, Mich.

Filed Feb. 24, 1977, Ser. No. 771,458

Int. Cl.² F28F *13/06*

U.S. Cl. 165—154 **10 Claims**



1. A recuperator comprising a cylinder for flue gases constituting a primary heat transfer surface, a core within said cylinder having a plurality of radial leaves extending outwardly to said cylinder thereby subdividing the same into a plurality of separate flue gas passageways each of which in cross section is bounded by two straight sides and an arcuate side, said radial leaves after receiving heat from said flue gases serving to reradiate said heat to said primary heat transfer surface, and a series of longitudinally spaced triangular baffles in each of said passageways, each baffle secured to the adjacent leaves, inclined to the horizontal, said baffles serving to interrupt said passageways and cause said flue gas to have a gentle swirling motion into and out of the spaces between the outer edges of said baffles and said cylinder, thereby enhancing the convective heat transfer between said flue gas and said primary heat transfer surface.

4,113,010

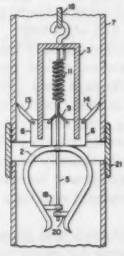
CASING STOP FOR WELL TOOLS AND AN INSERTION DEVICE THEREFORE

William Dwight Gramling, 5144 Newport Ave., Chevy Chase, Md. 20016

Division of Ser. No. 687,916, May 19, 1976, Pat. No. 4,070,134, which is a continuation-in-part of Ser. No. 569,056, Apr. 17, 1975, abandoned. This application Apr. 19, 1977, Ser. No. 788,781

Int. Cl.² E21B *23/02*

U.S. Cl. 166—213 **2 Claims**



1. Means for positioning and ejecting a restricting stop in well casing, said means comprising a vertically oriented body open at the lower end, fittings slidable on lower end of said

body, said fittings provided with resilient tabs held against and slidable on said casing, said fittings attached to said body, a vertically positioned rod attached to the top of and projecting through said open lower end of said body, a downwardly facing semi-circle of resilient bar compressed and slidable on said rod, said fittings remaining stationary relative to said body during downward movement of said ejecting means relative to said casing, said fittings remaining stationary relative to said casing and moving downward relative to said body during upward movement of said ejecting means relative to said casing, said downward movement of fittings relative to said body causing downward movement of said bar relative to said rod, said bar becoming ejected from said ejecting means, said bar contacting said well casing and becoming stationary in said well casing at a predetermined depth.

4,113,011

ENHANCED OIL RECOVERY PROCESS

George G. Bernard, La Mirada, and LeRoy W. Holm, Fullerton, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Mar. 7, 1977, Ser. No. 774,920
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—273 **18 Claims**

1. In a method for the recovery of oil from subterranean oil-bearing formations wherein carbon dioxide is injected into the formation at pressures above the miscible-displacement pressure to miscibly displace said oil to a recovery well, the improvement which comprises:

injecting into said formation not later than the injection of said carbon dioxide an aqueous solution containing from about 0.01 to about 10 weight percent of a surfactant comprising alkyl polyethylene oxide sulfates having 8 to 9 carbon atoms in the alkyl radical and from 1 to 5 ethylene oxide groups per molecule, said aqueous solution and said carbon dioxide being injected into said formation at a pressure above about 1,500 p.s.i. and above said miscible-displacement pressure.

4,113,012

RECLOSABLE CIRCULATION VALVE FOR USE IN OIL WELL TESTING

Robert T. Evans, and David L. Farley, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Oct. 27, 1977, Ser. No. 846,232
Int. Cl.[2] E21B *43/12, 47/00*
U.S. Cl. 166—264 **7 Claims**

1. A circulation valve apparatus for use in a test string having a flow channel therethrough and extending within a well bore from the surface to a formation to be tested comprising:

a tubular housing having an axial bore therethrough and arranged for incorporation into said test string with said axial bore communicating with said test string flow channel, said tubular housing having a circulation port providing fluid communication between the well bore exterior of said housing and said axial bore;

circulation valve means slidably located in said axial bore and movable between a first position preventing fluid communication through said circulation port into said axial bore, and a second position opening said circulation port and allowing fluid communication through said circulation port into said axial bore;

power mandrel means slidably located in said axial bore;

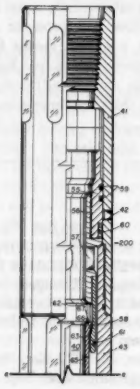
piston means on said power mandrel means responsive to pressure changes in said well bore for moving said power mandrel means;

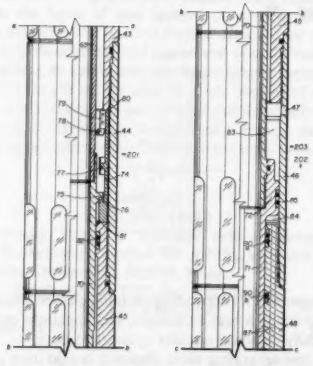
operating means between said power mandrel means and said tubular housing for imparting a bias to said piston means for holding said power mandrel means in the last position to which said power mandrel means moved responsive to said well bore pressure changes; and

indexing means operatively connecting said power mandrel means to said circulation valve means for moving said circulation valve means from its first position to its second position responsive to a predetermined movement of a plurality of movements by said power mandrel means, and for subsequently moving said circulation valve means from its second position to its first position responsive to a later predetermined movement of said power mandrel means.

6. A method of testing a formation using a testing string within an oil well bore extending from the surface to the formation to be tested, said testing string including a tester valve for opening and closing a flow channel through said testing string responsive to pressure changes in the well bore exterior of the testing string, said method comprising:

lowering said testing string into said well bore;





setting a packer mechanism at the end of said testing string for isolating said formation from the annulus of the oil well between the walls of the well bore and the testing string;

increasing the pressure in the well annulus;

responsive to said pressure increase, opening the tester valve in the testing string flow channel allowing fluid communication from the formation, through the testing string flow channel to the surface;

releasing the pressure increase in the well annulus;

responsive to said pressure release, closing said tester valve for closing-in said formation;

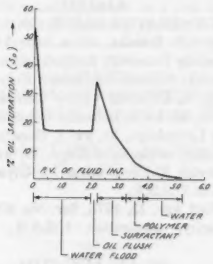
stepping an indexing means in a circulation valve in said testing string above said tester valve, which indexing

means maintains said circulation valve in the closed condition until after a predetermined number of steps;
repeating the increasing and releasing pressure steps a predetermined number of times to conduct a formation testing program;
responsive to a predetermined pressure release, opening said circulation valve;
circulating fluid through the well annulus, the open circulation valve and the flow passage in the testing string for displacing fluid in the testing string flow channel to the surface;
increasing the pressure in the testing string flow channel and the well annulus;
responsive to said pressure increase, closing said circulation valve; and
repeating the increasing and releasing pressure steps a predetermined number of times to conduct a subsequent formation testing program.

4,113,013
ASPHALTENES AS SACRIFICIAL AGENTS IN OIL RECOVERY PROCESSES

Will A. Ledoux, Houston; William Schoen, Missouri City, and Atul Kumar, Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 4, 1976, Ser. No. 738,494
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—275 **4 Claims**



1. A process for recovering oil from a subterranean reservoir when a surfactant is injected into the reservoir to sweep oil from the reservoir, the improvement which comprises:
injecting asphaltenes mixed with the surfactant.

4,113,014
PROCESS FOR REINFORCING GEOLOGICAL FORMATIONS

Rolf Kubens, Odenthal, and Herbert Gebauer, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 16, 1977, Ser. No. 796,935
Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623346
Int. Cl.[2] E21B *33/138*; C08G *18/76*; E02B *3/12*
U.S. Cl. 166—295 **14 Claims**

1. Process for reinforcing geological formations and loose rock and earth masses comprising introducing into the cavities of the geological formations or masses of rock and earth which are required to be reinforced reaction mixtures based on organic polyhydroxyl compounds and organic polyisocyanates which react to yield polyurethanes, characterized in that the polyisocyanate component used is a polyisocyanate mixture containing from about 10 to 80%, by weight, of 2,4'-diisocyanato-diphenylmethane.

12. A process for reinforcing geological formations and loose rock and earth masses comprising
(a) introducing a two-chamber cartridge into a previously prepared bore hole wherein
(i) one chamber of said cartridge contains an organic polyhydroxyl compound, and
(ii) the second chamber of said cartridge contains an organic polyisocyanate mixture comprising from about 10 to 80%, by weight, of 2,4'-diisocyanato-diphenylmethane; and
(b) destroying said cartridge inside the bore hole to obtain a reaction mixture which reacts to form a polyurethane.

4,113,015
PROCESS FOR TREATING WELLS WITH VISCOUS EPOXY-RESIN-FORMING SOLUTIONS

Franciscus H. Meijs, New Orleans, La., assignor to Shell Oil Company, Houston, Tex.

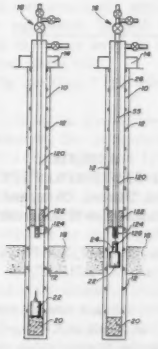
Filed Nov. 16, 1977, Ser. No. 852,175
Claims priority, application United Kingdom, May 30, 1977, 22756/77
Int. Cl.[2] E21B *33/138, 43/02*
U.S. Cl. 166—295 **6 Claims**

1. In a process for treating a well by injecting, into the well and into any fluid-containing permeable earth formation in fluid-communicaton with the well, an epoxy-resin-forming solution from which a self-curing partially-cured resin is subsequently precipitated, the improvement comprising:
dissolving in the resin-forming solution to be injected a viscosity-increasing oil-soluble polymer that provides a solution effective viscosity at least substantially equaling that of the fluid within the well and any fluid-containing permeable earth formation which is in fluid-communication with the well.

4,113,016
CASING PERFORATION METHOD AND APPARATUS

Donald E. Trott, 2302 E. Loma Vista, Victoria, Tex. 77901

Filed Sep. 26, 1977, Ser. No. 836,758
Int. Cl.[2] E21B *29/00*
U.S. Cl. 166—297 **13 Claims**



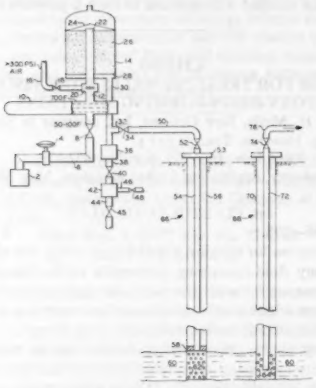
1. A method for perforating the casing of a well at a predetermined strata with a perforator means, comprising the steps of:
(a) depositing said perforator means within said casing below said strata,
(b) installing a tubing string with an attached packer within said casing,
(c) joining a wireline to said perforator means,
(d) positioning said perforator means at the level of said strata by means of said wireline, and
(e) activating said perforator means.

4,113,017

HOT EFFLUENT FROM PARTIAL OXIDATION OF NATURAL GAS INJECTED IN OIL RECOVERY PROCESS

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 9, 1976, Ser. No. 749,196
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—303 3 Claims



1. A method for recovering oil from an underground formation comprising injecting into said formation combustion products containing both gas and liquid from partial oxidation of natural gas said combustion products at a temperature in the range of about 250° to about 400° F thereby providing hot gases, liquid solvent, and driving force for treatment of said underground formation.

4,113,018

OIL WELL TESTING SAFETY VALVE

Burchus Q. Barrington, Duncan, Okla., and Jim R. Williamson, Carrollton, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jun. 30, 1977, Ser. No. 811,506
Int. Cl.[2] E21B *47/00*
U.S. Cl. 166—334 9 Claims

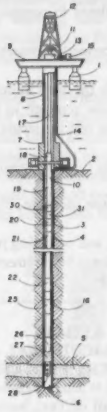
1. An apparatus for use in a testing string extending to a submerged formation in an oil well comprising:

slip joint means in the testing string for absorbing wave motion;

means above said slip joint means for collapsing said slip joint means in the event said testing string is freely lowered into said oil well;

full opening valve means in said testing string above said slip joint means for controlling fluid flow through the interior of said testing string, said valve means being in the normally open position when the valve means is in tension, and being in the closed position when said valve means is in compression; and

operating means in said valve means for maintaining said valve means in the open position when tension appears between the ends of said valve means, and for closing said



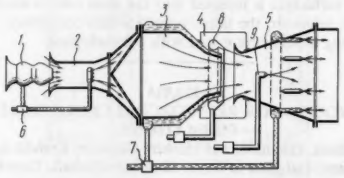
valve means when compression appears between the ends of said valve means.

4,113,019

INERT GAS GENERATOR BASED ON AIR JET ENGINE

Georgy Georgievich Sobolev, ulitsa Schepkina, 47/3, kv. 64, Moscow; Anatoly Ivanovich Kozljuk, ulitsa Postysheva, 135, kv. 46, Donetsk; Mikhail Vasilievich Kolyshenko, ulitsa Artema, 161, kv. 6, Donetsk; Valery Leonidovich Makarenko, ulitsa Baikova, 30, kv. 2, Donetsk; Valentin Vasilievich Vasilenko, ulitsa Levitskogo, 23, kv. 2, Donetsk; Leonid Denisovich Vishnevsky, ulitsa Levitskogo, 27, kv. 8, Donetsk, and Viktor Ivanovich Kukhno, ulitsa M. Ulyanovoi, 53, kv. 30, Donetsk, all of U.S.S.R.

Filed Apr. 22, 1976, Ser. No. 679,437
Claims priority, application U.S.S.R., Aug. 13, 1975, 2157152[I]
Int. Cl.[2] A62C *35/36*
U.S. Cl. 169—12 5 Claims



1. An inert gas generator for extinguishing fires comprising:

an air jet engine with fuel supply means adapted to produce exhaust gases; said air jet engine communicating with an ejector channel with fuel supply means, and adapted to draw in outside air; said ejector channel communicating with an afterburning chamber with cooling means and means for supplying an inert gas; said afterburning chamber communicating with a low pressure depression chamber adapted to limit access of outside air into the flow of said gases; said depression chamber communicating with manifold means for supplying an inert gas to the gas flow; said manifold means communicating with a diffuser with means for feeding halogenated hydrocarbons into the gas flow which exits at high velocity.

4,113,020
FIRE SAFETY CHRISTMAS ORNAMENT

Anthony Panetta, 39 Conkling St., Basking Ridge, N.J. 07920

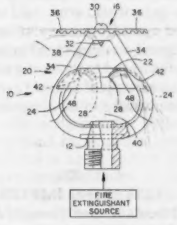
Filed Dec. 13, 1976, Ser. No. 749,608
Int. Cl.[2] A62C 35/02
U.S. Cl. 169—26 5 Claims

1. A decorative fire extinguishing tree ornament comprising a hollow two piece structure, the two pieces attached at spaced apart points along their juncture by a hot melt adhesive which softens at a temperature greater that 100° F., at least one hinge-like structure located at the top of said ornament and joining said two pieces, a compressed spring positioned inside the ornament, each end of said spring contacting a portion of each of the pieces and tending to force the pieces apart, a single means at the top of the ornament at the juncture of the two pieces for suspending said ornament on a tree limb, said ornament containing a fire extinguishing powder.

4,113,021
FIRE EXTINGUISHANT DISPENSING NOZZLES

Clements M. Werner, 4246 S. Whitnall Ave., Milwaukee, Wis. 53207

Filed Feb. 17, 1977, Ser. No. 769,425
Int. Cl.[2] A62C 37/14
U.S. Cl. 169—37 3 Claims

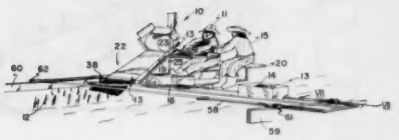


1. An upright sprinkler for attachment to a supply of a fire extinguishant, the sprinkler including a nozzle defining an opening for directing upwardly a stream of extinguishant, a deflector for deflecting a portion of the stream generally radially outwardly from the axis of the nozzle opening, means for supporting the deflector in fixed spaced-apart relation to the nozzle, and a second deflector for deflecting a second portion of the stream generally downwardly concentric with the axis of the nozzle opening, the second deflector comprising a downwardly facing concave surface having a radially outer, downwardly directed discharging lip, the first deflector including a radially outer skirt extending downwardly at an angle to the nozzle axis, the skirt terminating at a serrated edge to generate a fine extinguishant spray directed generally radially about the nozzle axis, and the second deflector including an inner directing lip defining a proportioning aperture for passing a fixed portion of the stream from the nozzle upwardly to the first-mentioned deflector and for directing a second portion of the stream upwardly, radially outwardly, and then downwardly along the downwardly facing concave surface to the discharging lip, the support means comprising a yoke having at least two arms, the second deflector including at least two slots for receiving the arms, and the arms defining notches within which the second deflector fits.

4,113,022
PLANT PULLER

Joe Balinte, and Michael Verhaeghe, both of P.O. Box 273, Courtland, Ontario, Canada

Filed Oct. 20, 1976, Ser. No. 734,091
Int. Cl.[2] A01D 25/04
U.S. Cl. 171—61 30 Claims



1. A plant puller for pulling growing plants from a bed comprising:

(a) a frame mounted for travel over the bed;

(b) a conveyor mounted on the frame at an inclined position relative to the bed, including at least one pair of juxtaposed loop belts of resilient material, each having idler and drive wheels, the pair of belts being jointly disposed to have corresponding lower ends in close proximity to the ground to form an input terminus to the conveyor and having corresponding upper ends forming an upper terminus, and means attached to the frame for holding the adjacent segments of the loop belts in substantially juxtaposed relation between their respective wheels so that each belt has a proximate surface adjacent to that of the other belt from the lower terminus continuously to the upper terminus;

(c) means carried by the frame for counter-rotating each belt and their wheels and each belt so that the proximate surfaces of the two adjacent belts travel in the same direction from the lower terminus to the upper terminus;

(d) a collection receptacle, carried by said frame, and mounted below the upper terminus of the conveyor onto which the pulled plants fall;

(e) a track rigidly positioned at a predetermined distance above the bed;

(f) means for advancing the frame over the track and hence over the bed whereby the cooperative travel of the frame over the bed and of the conveyor belts causes the belts at the lower terminus to encompass the upper portion of the stalk of a plant and to pull the plant out of the bed whereby the plant is conveyed by the conveyor up and along the conveyor to be discharged from the upper terminus thereof and to fall onto the collection receptacle; and

(g) means mounted in the frame for locating the lower terminus of the conveyor at a specific predetermined distance from the bed for pulling larger plants above a predetermined height by the plant puller, whereas smaller plants below the predetermined height are left in the bed, during the travel of the plant puller over the bed.

4,113,023
MULTIPLE SHAFT, GROUND-RAKING ATTACHMENT FOR BUCKET-EQUIPPED TRACTORS

Theodore N. Baskett, 9514 Portland Ave., Tacoma, Wash. 98445

Filed Dec. 6, 1976, Ser. No. 747,966
Int. Cl.[2] A01D 19/02
U.S. Cl. 171—63 13 Claims

1. For use with a tractor having a material handling bucket

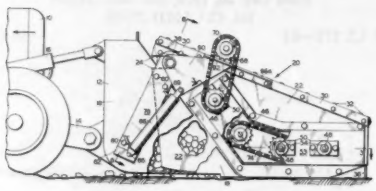
including a pair of spaced side walls and an open fron end, a ground-raking attachment comprising:

(a) a frame including a pair of spaced side members,

(b) frame mounting means mounting the frame on the bucket,

(c) at least one pair of rotatable shafts,

(d) shaft mounting means rotatably mounting the shafts between the frame side members in substantially parallel, spaced relation to each other,



(e) a plurality of rake teeth,

(f) rake tooth mounting means mounting the teeth radially on the shafts, the teeth on one shaft meshing with the teeth on the other, and

(g) drive means connected to the shafts for rotating them in timed relation to each other for advancing material engaged by the teeth progressively into the bucket.

4,113,024

SOIL CULTIVATING IMPLEMENTS

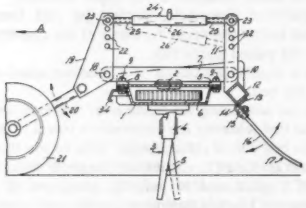
Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Filed Feb. 28, 1977, Ser. No. 772,858

Claims priority, application Netherlands, Mar. 1, 1976, 7602084

Int. Cl.[2] A01B *33/06*

U.S. Cl. 172—59 **19 Claims**



1. A soil cultivating implement comprising a frame and soil working means supported on an elongated portion of said frame, a leading supporting member being pivoted to said frame and positioned in front of said frame portion, a rear supporting member being pivoted to said frame and located to the rear of said frame portion, each of the supporting members bearing on the ground and supporting the implement during normal operation, said supporting members being connected to said frame portion by pivots and interconnected to one another with linkage means, said linkage means including at least one connection member located substantially above said frame portion, and said pivots, the pivotal movements of one supporting member with respect to the frame portion being transmitted to the other member through said pivots and the connection member, whereby the pivotal movements of said one member in one vertical direction displaces the other member in an opposite direction during implement travel.

4,113,025

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

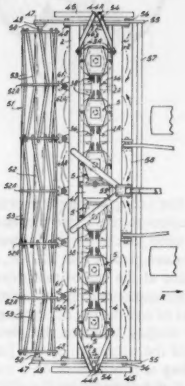
Filed Aug. 23, 1976, Ser. No. 716,768

Claims priority, application Netherlands, Aug. 25, 1975, 7509992

The portion of the term of this patent subsequent to Aug. 30, 1994, has been disclaimed.

Int. Cl.[2] A01B *33/06*

U.S. Cl. 172—59 **9 Claims**



1. A soil cultivating implement comprising a frame and a row of soil working members supported on said frame, said members being mounted on corresponding upwardly extending shafts, each member comprising radially extending arms, driving means connected to rotate neighboring members in relative opposite directions and said row extending transverse to the direction of implement travel, each member comprising at least two tined cultivating tools that are freely rotatable about respective downwardly extending shaft means supported adjacent the ends of said arms, said arms being substantially equally spaced apart from one another around the shaft of the corresponding soil working member and positioned such that the rotating paths of the tools on the adjacent arms overlap to work a continuous strip of soil said axes of rotation of the tools extending downwardly in convergent relationship with one another.

4,113,026

SOIL CULTIVATING IMPLEMENTS

Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Filed May 14, 1976, Ser. No. 686,327

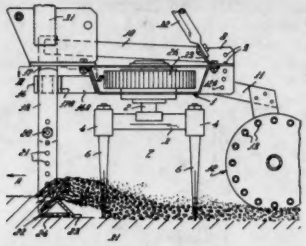
Claims priority, application Netherlands, May 15, 1975, 7505696

Int. Cl.[2] A01B *33/06, 33/16*

U.S. Cl. 172—59 **9 Claims**

1. A soil cultivating implement comprising a frame and a plurality of soil working rotors supported in a row on an elongated portion of said frame, said row extending transverse to the direction of implement travel, said rotors having downwardly extending tines and being rotatable about upwardly extending axes defined by corresponding shafts, driving means connected to rotate adjacent rotors in relative opposite directions, a transverse soil scraping and displacing member being connected to said frame and positioned adjacent, but spaced apart from the front side of the paths described by the tines of the rotors, said displacing member being elongated and comprising a leading cutting edge that is located at about the same horizontal level as the lower tips of said tines and substantially

forwardly thereof leaving a space said displacing member being positioned to displace a layer of soil upwardly and rearwardly to fall into said space and the rotating paths of the tines



of said rotors during operation, whereby the soil is deposited in a crumbled layer on a substantially unworked ground base an elongated supporting roller being interconnected to the frame and positioned to the rear of said rotors.

4,113,027

SOIL CULTIVATING IMPLEMENTS

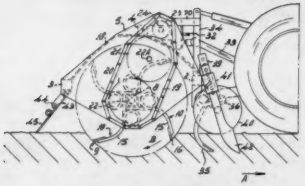
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Mar. 30, 1976, Ser. No. 672,036

Claims priority, application Netherlands, Apr. 1, 1975, 7503821

Int. Cl.² A01B *33/02*

U.S. Cl. 172—70 **5 Claims**



1. A soil cultivating implement comprising a frame and an elongated cultivating member rotatably mounted on said frame, said cultivating member being rotatable about a substantially horizontal axis and driving means connected to rotate said member, said cultivating member including a plurality of tines resiliently supported on a central support, said central support being polygonal in cross section and said tines being fastened to corresponding flat sides of the central support around its axis of rotation, each tine comprising an inner fastening portion clamped to a flat side of the support and an outer arcuately curved portion connected to said inner portion through an integral helical coil, said coil being located behind a plane which passes through the outer free end of the corresponding tine and the axis of rotation of said support, each coil comprising at least two substantially complete turns of 360° and the longitudinal axis of each coil intersecting the rotational axis of said support at an acute angle.

4,113,028

LIFT FOR DRAGGED IMPLEMENT

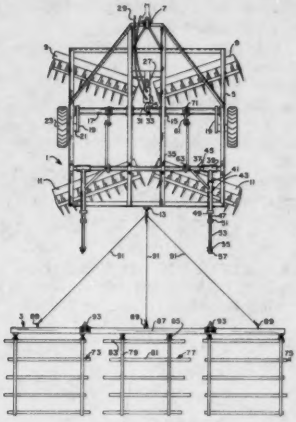
Robert D. Glueck, Rte 2, Box 122, Chaffee, Mo. 63740

Filed Apr. 15, 1977, Ser. No. 787,751

Int. Cl.² A01B *25/00*

U.S. Cl. 172—178 **12 Claims**

1. In combination with a farm implement having transporting wheels and actuating means for selectively lowering said wheels to a ground-engaging transport position, said implement further including hitch means for dragging a generally horizontal towed implement behind said hweeled farm implement, said hitch means comprising a plurality of flexible ties connected to a common tie point on said wheeled farm implement, improved lift means for transporting said dragged implement independent of said hitch means, said lift means comprising arms pivotably mounted on the wheeled farm implement, engagement means on said arms for releasably engaging



aligned connections on said dragged implement, and linkage means operatively connecting said arms to said actuating means for raising said arms sufficiently to carry said dragged implement suspended by said engagement means in a generally vertical position when said actuating means lower said wheels to said transport position.

4,113,029

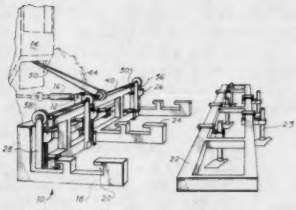
QUICK LATCH FOR FARM TOOL BAR

Vernon Ramsower, Rte. 3, Plainview, Tex. 79072

Filed Feb. 17, 1977, Ser. No. 769,433

Int. Cl.² A01B *51/00*

U.S. Cl. 172—272 **7 Claims**



1. In an apparatus for removably supporting an elongated farm tool bar having

a. a frame adapted to be secured at its front end to a farm vehicle, said frame including

b. a plurality of parallel rearwardly extending unimpeded support arms,

c. each of the support arms having at least one tool bar receiving portions thereon,

d. the tool bar receiving portions in one arm being substantially laterally aligned with the receiving portions of the other arm, and

e. said farm vehicle having means for raising and lowering the frame; and the improved structure for locking the tool bar into each of the arms comprising in combination with the above:

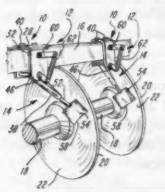
f. each of the tool bars receiving portions being C-shaped with the open portion forward facing the front end of the frame,
g. movable lock members mounted for attachment on the frame,
h. said lock members contacting the front of the tool bar when the tool bar is received in the C-shaped receiving portion of the support frame,
j. a shaft extending laterally along the frame journalled thereto, and
k. flexible members attached to the shaft,
m. each of the flexible members interconnecting the shaft and one of the lock members, whereby
n. rotation of the shaft winds the flexible members around the shaft,
o. thus raising the lock members from an engaged position to an unengaged position.

4,113,030

TWO-WAY SCRAPER FOR GROUND TILLAGE DISCS

Harold G. Walker, 724 3rd St., Wakeeney, Kans. 67672

Filed Jan. 12, 1977, Ser. No. 758,655
Int. Cl.[2] A01B *23/06*
U.S. Cl. 172—566 **6 Claims**



1. In a disc scraper assembly of the type having a bracket attachable to an implement frame above and to one side of the concave face of a ground tillage disc supported therebeneath and a blade-carrying arm subassembly depending from said bracket and extending downwardly therefrom into position to scrape said concave disc face, the improved connection between said arm subassembly and bracket which comprises: means carried by said bracket mounting said arm subassembly for pendulum-like relative pivotal movement therebeneath between a first operative position swung to one side of said axis of pivotal movement and a second operative position on the opposite side thereof, first spring attachment means carried by said arm subassembly for pivotal movement therewith between its operative positions, means carried by said bracket defining a second spring attachment means movable from a position on one side of the axis of pivotal movement of said arm subassembly to a second position on the other side thereof, and means comprising a tension spring connected between said first and second spring attachment means coacting therewith when both are positioned on the same side of said axis of pivotal movement to yieldably bias the supporting arm subassembly against a disc positioned on the same side thereof.

4,113,031

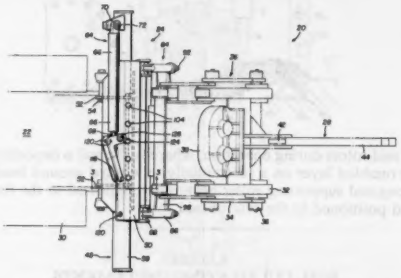
POWER SHIFT MECHANISM FOR EARTH WORKING IMPLEMENTS

Phillip G. Venable, Orion, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 25, 1977, Ser. No. 818,702
Int. Cl.[2] E02F *3/85*
U.S. Cl. 172—667 **10 Claims**

5. A generally vertical plow-like earth working implement mounted on a prime mover, said prime mover having a support frame, said implement mounted on a slide bracket and said bracket slideably mounted on said support frame permitting lateral shifting of said earth working implement relative to said prime mover, the improvement comprising:

an extensible and retractable fluid operated piston-cylinder mounted at one end to said support frame, the opposed end of said piston-cylinder connected to a pivot link, said pivot link pivotally connected to said slide bracket, said slide bracket having releasable connectors spaced on opposed sides of said bracket-link pivotal connection and said link having two mating releasable connectors, said



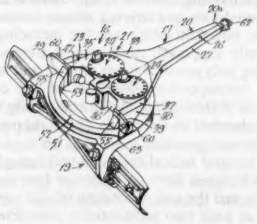
pivotal bracket-link connection and said releasable link connectors defining a triangle, and said piston-cylinder pivotally connected to said link between said releasable link connectors, whereby said piston-cylinder may be extended or retracted to rotate said pivot link about said bracket-link pivotal connection and slideably shift said bracket and said earth working implement when one of said releasable link connectors is connected to said bracket.

4,113,032

MOTOR GRADER WITH DRAW BAR AND CIRCLE SUPPORT STRUCTURE

Carroll Richard Cole, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 26, 1976, Ser. No. 735,245
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—781 **18 Claims**



1. In a motor grader which includes a circle member having an internal ring gear and a grader blade suspended beneath said circle member, a unitary drawbar and circle mounting structure comprising, in combination:

a box-like drawbar beam having top and bottom plates and side plates, said beam increasing in width from a connecting end toward a rearward circle mounting end;
an enclosed drive housing integral with the rear portion of said drawbar beam, said drive housing having a lower portion extending below the drawbar beam bottom plate and having an upright forward wall which is an arc of a circle struck about the center of rotation of the circle member;
and a rearward portion of said circle mounting structure

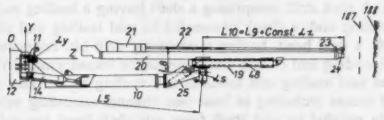
which has its forward part integrally connected to said lower portion of the enclosed drive housing and which includes an upright arcuate wall that completes said circle struck about the center of rotation of the circle member so that said drive housing and said rearward portion cooperate to provide a mounting for the circle member below the plane of the drawbar beam bottom plate, and there being a drive opening in the lower portion of the drive housing forward wall.

4,113,033

METHOD AND ARRANGEMENT FOR POSITIONING A WORKING TOOL TO A PREDETERMINED DIRECTION AND/OR A PREDETERMINED POINT

Lars Alfred Lindblad, Saltsjo-Boo, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 639,693, Dec. 11, 1975, abandoned. This application Sep. 2, 1977, Ser. No. 830,213
Claims priority, application Sweden, Dec. 19, 1974, 7415975
Int. Cl.[2] E21C *11/02*
U.S. Cl. 173—1 **20 Claims**



1. In a method of automatically positioning an elongated rock drilling apparatus to a plurality of predetermined positions in space, comprising swinging a drill boom (**10**) relative to a boom bracket (**12**), swinging a feed bar (**20**) relative to said drill boom and displacing said feed bar (**20**) relative to said drill boom and boom bracket, said boom and feed bar being swung to reach alternate positions, moving a rock drilling machine (**21**) longitudinally slidably to and fro along said feed bar, said rock drilling machine driving a working implement, and defining said plurality of predetermined positions by a programmed drilling pattern,

the improvement comprising:

non-mechanically programming said plurality of predetermined positions such that they are in an imaginary plane (**187**) which is spaced from a rock surface (**188**) to be worked by entering set values corresponding to either of said predetermined directions and positions in a computer unit (**93**), sensing the actual values corresponding to either of the instantaneous direction and position of said drill bit, calculating the differences between said actual values and said set values, transforming said differences for providing control signals, and positioning said drill bit responsive to said control signals by means (**15**) for positioning said drill bit.

4,113,034

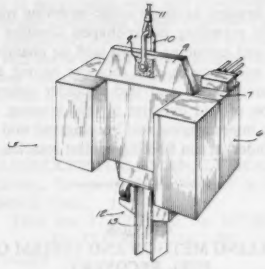
UNIAXIAL VARIABLE VIBRATORY FORCE GENERATOR

Roger L. Carlson, Fridley, Minn., assignor to Raygo, Inc., Minneapolis, Minn.

Filed Jun. 20, 1977, Ser. No. 807,833
Int. Cl.[2] E02D *7/18*
U.S. Cl. 173—49 **4 Claims**

1. In a vibratory force generator having a rigid frame structure through which the generated vibratory force may be uniaxially transmitted to a part which is to be subjected to said force, wherein the vibratory force is produced by rotation of a plurality of pairs of rotary eccentric weights rotatably mounted in said rigid frame structure with said pairs at spaced locations on the axis along which the vibratory force is to be transmitted, the weights of each pair thereof being constrained to counter-rotation about fixed axes that lie in a plane normal to said axis in such phase relationship that the direction of the vibratory force resulting from their counter-rotation, is confined to said axis, wherein power means drivingly connected with all of the rotary eccentric weights simultaneously imparts rotation thereto, and wherein an adjustable coupling between adjacent pairs of counter-rotating eccentric weights enables the phase relationship between said pairs of eccentric weights to be varied from an in-phase relationship for the production of maximum force, to an infinite number of less than in-phase relationships for selected reduction in the magnitude of the generated vibratory force; the improvement by which said coupling can be adjusted from a location remote from the vibratory force generator and without altering the RPM of the eccentric weights or otherwise interfering with them and which comprises:

A. first and second parallel shafts, one having a fixed driving relationship with the rotary eccentric weights of only one of said adjacent pairs thereof and the other having a fixed driving relationship with the rotary eccentric weights of only the other one of said adjacent pairs thereof;



B. first and second meshing gears, the first gear being on and fixed against relative rotation with respect to said first shaft and the second gear being on but rotatable with respect to said second shaft;

C. means for securing said second gear and said second shaft against relative rotation from a selected angular relationship, the selection of which determines the phase relationship of said adjacent pairs of rotary eccentric weights, said last means comprising

(1) a sleeve axially slidably but non-rotatably mounted on said second shaft, and

(2) means forming a helical splined driving connection between said sleeve and said second gear so that shifting said sleeve axially along the second shaft and with respect to said second gear adjusts the phase relationship between said adjacent pairs of rotary eccentric weights.

4,113,035

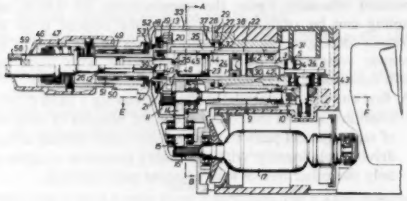
HAMMER DRILL WITH DRIVE AND PERCUSSION ELEMENTS ACCOMMODATED IN A CYLINDER

Erwin Stiltz, Winnenden-Schelmenholz; Rudolf Hoyer, Althütte, and Heinz Lindenmayer, Hegnach, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Germany

Filed Apr. 21, 1977, Ser. No. 789,680
Int. Cl.[2] B25D *9/00*
U.S. Cl. 173—116 **7 Claims**

1. A hammer drill comprising a housing; a cylinder received in said housing and defining a cylindrical piston chamber; means defining an air chamber around at least a portion of said piston chamber sealed against the ambient atmosphere and against the adjacent component parts of said housing; said housing defining a tool-receiving chamber aligned and communicating with said piston chamber; a percussion body movable in said piston chamber against a tool in said tool-receiving chamber; a motor-driven piston reciprocable in said piston

chamber relative to said percussion body; said cylinder also defining a pneumatic buffer zone between said piston and said percussion body, whereby air in said buffer zone provides a coupling and buffing fluid between said piston and said percussion body; a first air passage opening defined in said cylinder and interconnecting said air chamber and the interior of said cylinder in said buffer zone, said first air passage being spaced from said piston when said piston is in a forward dead-center



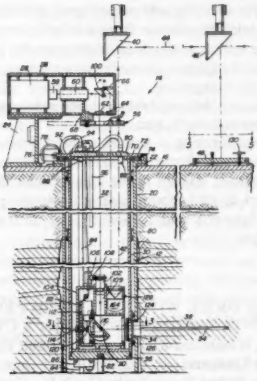
position; said housing having a collar-receiving recess; a radially outwardly extending collar-shaped shoulder formed on said cylinder and extending across said air chamber and into the recess in said housing, said shoulder having air passages extending therethrough, and said shoulder determining the spatial position of said cylinder in said housing; and means form-lockably interengaging said housing and said cylinder to hold said cylinder in said housing against rotation.

4,113,036

LASER DRILLING METHOD AND SYSTEM OF FOSSIL FUEL RECOVERY

Daniel W. Stout, 110 Wettaw La., North Palm Beach, Fla. 33408

Filed Apr. 9, 1976, Ser. No. 675,582
Int. Cl.² E21B 7/14
U.S. Cl. 175—11 **19 Claims**



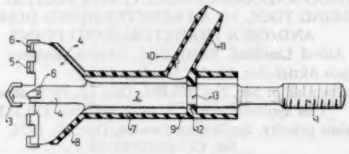
1. Apparatus for drilling in an underground formation extending from a vertical bore hole, including a laser beam generator projecting a laser beam through the vertical bore hole substantially parallel to a longitudinal axis, reflector means for reflecting the laser beam along a drilling path into the formation transversely of said longitudinal axis, an elongated tubular housing, means for angularly adjusting the housing about said longitudinal axis within the bore hole, and adjusting means connected to the reflector means for angular displacement thereof about perpendicular intersecting axes intersected by said longitudinal axis.

4,113,037

ROCK DRILL

Karl Wanner, Echterdingen, and Wilbert Reibetanz, Leinfelden, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1976, Ser. No. 749,034
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605097; Aug. 11, 1976, 2636083; Oct. 9, 1976, 2645693
Int. Cl.² E21B 21/00
U.S. Cl. 175—207 **31 Claims**



1. A rock drill comprising a shaft having a leading end and a trailing end; a shank connected to said trailing end of said shaft; a drill head, having a centering drill bit, connected to said leading end of said shaft; means for transporting drillings from said leading end towards said trailing end of said shaft, said means including at least one channel extending substantially parallel to said shaft from said drill head toward said shank; and a shell coaxially surrounding said shaft and bounding said channel, said shell having an open front end adjacent said drill head, a closed rear end facing said shank and at least one substantially transverse bore adjacent said rear end and open at the outer surface of said shell, said shell having at least two portions, including a front portion adjacent said front end of said shell and constituted of a wear-resistant material, and a rear portion adjacent said rear end of said shell, said front portion of said shell having a first section extending towards said rear portion of said shell and having a reduced thickness, said rear portion of said shell having a second section extending towards said front portion of said shell and having a reduced thickness, one of said sections overlapping the other section.

4,113,038

DRILLING JAR

George M. Clark, Box 92002, Houston, Tex. 77006

Filed Apr. 18, 1977, Ser. No. 788,625
Int. Cl.² E21B 17/00
U.S. Cl. 175—300 **9 Claims**

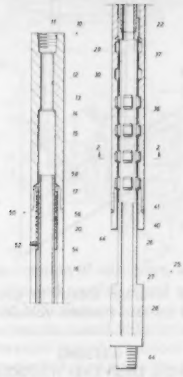
1. A drilling jar for use with a drill string to assist in unsticking the drill string, comprising:

(a) an upper hollow mandrel having
  (1) connector means enabling said upper mandrel to be connected into a drill string;
  (2) a packer therein for sealing against a member inseated thereinto;
  (3) a lower shoulder on said mandrel useable as a hammer;
  (4) first and second spaced encircling internal grooves separated by a land in the lower portion of said mandrel;
  (5) a transverse shoulder interrupting said grooves;
  (6) a transverse groove across said land, said groove cooperating with said land to define a spline rib parallel to the axis of said upper mandrel;

(b) a lower hollow mandrel having
  (1) an upper stinger pipe axially communicated with said lower mandrel and telescoped into said packer for sliding and sealing movement in said upper mandrel;
  (2) an upwardly facing shoulder adopted to be used as an anvil and arranged on said lower mandrel for hammering by said lower shoulder on said upper mandrel;
  (3) connector means at the lower end of said lower man-

drel enabling said lower mandrel to be connected to the lower portions of a drill string;

(4) a protruding lug extending from said stinger pipe and having a profile such that said lug fits into either of said internal grooves and can rotatably move in said grooves until movement carries against said transverse shoulder whereupon said lug is constrained by said shoulder against further rotation in said grooves on drilling where the drill string turns to the right so that said upper hollow mandrel and said lower hollow mandrel



rotate together as a unit; and where said lug is moved away from said transverse shoulder and moves into alignment with said transverse groove wherein said lug has a profile to enable said lug to slidably move along said transverse groove as said upper and lower mandrels are telescoped relative to one another; and

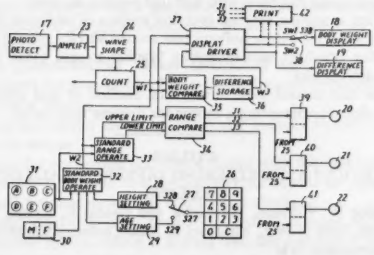
(5) said lug moving between said first and second encircling grooves on telescoping movement wherein the travel of said lug is equal to the stroke of said upper mandrel as it hammers against said lower mandrel to impact a jarring impact to the drill string.

4,113,039

BODY WEIGHT MEASURING APPARATUS

Tsutomu Ozaki, Amagasaki, and Setsuo Hijikata, Yao, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Aug. 9, 1976, Ser. No. 712,952
Claims priority, application Japan, Aug. 11, 1975, 50-98202
Int. Cl.[2] G01G *19/44*
U.S. Cl. 177—25 **22 Claims**



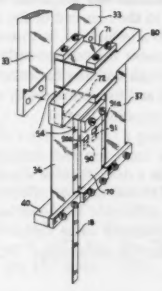
1. A body weight measuring apparatus, comprising sensing means responsive to the body weight of a person, being weighed on said apparatus to provide a measured displacement value representing the actual body weight, signal generating means operatively connected to said sensing means for generating an electrical signal representative of said actual body weight, setting means for providing fixed conditioning data including at least a reference signal value associated with the height of said person being weighed, signal evaluating means operatively connected to said setting means for determining a standard range of body weight values correlated to said conditioning data, means operatively connected to said signal generating means and to said signal evaluating means for determining the relativity of said measured actual body weight value relative to said standard body weight range values, and display means responsive to an output from said relativity determining means for displaying the result of said determining and correlating, wherein said signal evaluating means for determining a standard range of body weight values comprise first means responsive to said fixed conditioning data to evaluate a standard body weight value out of said standard range of body weight values and second means responsive to said first means and thus to said standard body weight value for evaluating an extremity value of said standard body weight range, said first means comprise memory means for storing a list of a plurality of standard body weight values in the form of electrical signals as classified in accordance with said conditioning data, said apparatus further comprising means responsive to said setting means and operatively connected to said memory means for addressing said list of standard body weight values for selectively reading out the corresponding standard body weight value to provide a respective electrical signal.

4,113,040

NULL TRANSDUCER FOR AN ANALYTICAL BALANCE

Anthony Storace, Tarrytown, N.Y., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jun. 17, 1977, Ser. No. 807,393
Int. Cl.[2] G01G *3/14, 3/08*
U.S. Cl. 177—211 **5 Claims**



1. In an analytical balance having a balance beam which pivots in a first direction about a base in response to a known weight that is displaceable along said balance beam, and which pivots in a second, opposite direction in response to an unknown weight that acts upon the balance beam, a null transducer for detecting a balance condition in said balance beam, said null transducer comprising:

a first and second band each connected to said base and each supporting the balance beam, said bands each being relatively thin so as to offer little resistance to the balance beam in bending, while being relatively stiff in an axial direction for supporting the weight of said balance beam;

a third band carried by said base and supporting the balance beam, said third band being relatively thick with respect to said first and second bands and bendably mounted to be relatively soft in an axial direction supporting the weight of said balance beam; and

strain gage means disposed upon said third band for detecting when said balance beam has pivoted from a balanced

condition, while being relatively unaffected by changes in weight active upon said third band in an axial weight supporting direction.

4,113,041

METHOD AND TRACTOR FOR TOWING AIRCRAFT

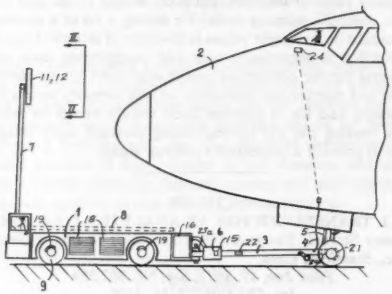
Mogens Birkeholm, Kagsaavej 59, DK-2730 Herlev, Denmark

Continuation of Ser. No. 584,029, Jun. 5, 1975, abandoned. This application Apr. 11, 1977, Ser. No. 786,565

Claims priority, application United Kingdom, Jun. 15, 1974, 26624/74

Int. Cl.[2] **B60D** *7/00;* **B60T** *8/02*

U.S. Cl. 180—14 C **10 Claims**



1. Towing apparatus comprising

a tractor having a front end and a rear end;

a tow bar hinged to the rear end of the tractor and adapted to be coupled to a vehicle to be towed;

a first sensing element for continuously measuring a force transmitted through said tow bar between said tractor and a towed vehicle and for continuously emitting a measured value signal in response thereto;

means for generating a traction effect of said tractor; and

a control unit for receiving and comparing said measured value signal with a desired value signal and for delivering a control signal to said traction effect generating means in response to a difference between said measured value signal and said desired value signal to selectively adjust the traction effect of the tractor.

4,113,042

MANUAL CONTROL HANDLE FOR ELECTRIC VEHICLE

Ronald E. Vaill, Penn Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 1, 1976, Ser. No. 737,366

Int. Cl.[2] **B62D** *51/04*

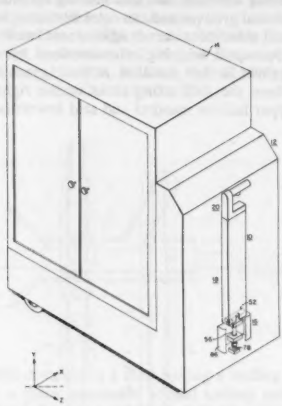
U.S. Cl. 180—19 H **8 Claims**

1. Apparatus for manual control of an electric traction vehicle comprising:

means for speed selection pivoted at one end on said vehicle and having a slotted portion thereon;

leverage means having a free end extended within said slotted portion, and a secured end;

means for electrical potential selection, connected to said secured end of said leverage means, for rotary displacement upon actuation of said leverage means, with said rotary displacement defining a voltage control signal, whereby rotation of said speed selection means by the user



displaces said leverage means to provide said voltage control signal for said traction vehicle.

4,113,043

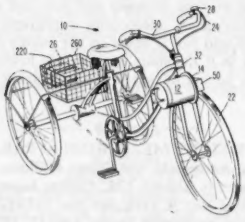
APPARATUS FOR DRIVING WHEELED VEHICLES

Jack P. Palmer, 509 1/2 Paden St., Endicott, N.Y. 13760

Continuation of Ser. No. 453,554, Mar. 21, 1974, abandoned. This application Sep. 7, 1976, Ser. No. 721,154

Int. Cl.[2] **B60K** *5/12, 17/30*

U.S. Cl. 180—33 A **5 Claims**



1. A mounting bracket for mounting a drive assembly for driving a cycle having at least two wheels comprising a substantially flat plate having a single bend therein, which bend separates said flat plate into first and second surfaces;

a first mounting hole on said first surface of said plate and a second mounting hole on said second surface of said plate for attaching said mounting bracket to said cycle to be driven; and

first and second slots in said first surface of said plate for slideably mounting a motor for driving said cycle.

4,113,044

ARTICULATED STEERING DIFFERENTIAL LOCK RELEASE

Douglas W. Williams, Waukesha, and George E. Kaiser, West Allis, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

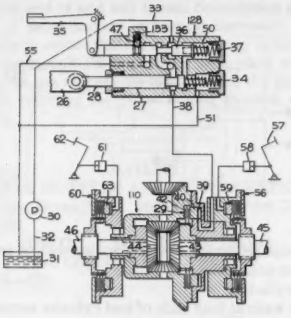
Filed Dec. 15, 1976, Ser. No. 750,918

Int. Cl.[2] **B60K** *17/34*

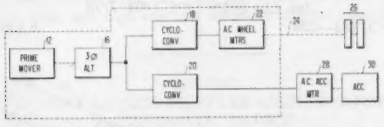
U.S. Cl. 180—51 **10 Claims**

1. A differential lock release for an articulating vehicle comprising, an articulating joint including a bearing pivotally connecting one bogie to another bogie of the articulated vehi-

cle, a cam mounted on one of the bogies, a follower mounted on the other bogie of the articulated vehicle, a differential lock control mechanism connected to the follower, control means operating a differential lock, a differential on a vehicle including differential locking means defining a differential clutch for releasing and locking said differential and providing differential and synchronous rotation of said gears, a wheel axle connected to one side gear and another wheel axle connected to another side gear, said control means connecting said differential lock control mechanism to said differential to operate said differential for differential and synchronous rotation of said axles responsive to articulation of said vehicle.



4,113,045
ALL-ELECTRIC A.C. TRACTOR
James H. Downing, Jr., Rte. 2, Box 90, Louisa, Va. 23093
Filed Feb. 16, 1977, Ser. No. 769,378
Int. Cl.² B60L *11/08*
U.S. Cl. 180—65 C **12 Claims**



1. In combination:

a land vehicle having a ground-engaging traction means;

a source of polyphase electrical power mounted on said vehicle;

first cycloconverter means electrically coupled to said source for providing a first variable frequency polyphase power output;

polyphase motor means mechanically coupled to said traction means;

means for energizing said motor means with the first power output from said first cycloconverter means to operate said traction means and drive said vehicle;

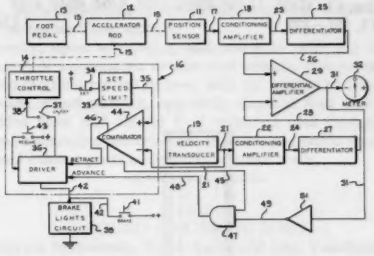
second cycloconverter means electrically coupled to said source for providing a second variable frequency polyphase power output;

a work-producing device associated with said land vehicle;

polyphase slave motor means associated with said device; and

means for energizing said slave motor means with the second power output for operating said device.

4,113,046
VEHICLE FUEL ECONOMY INDICATOR
Roberto Arpino, 4722 Shire Ridge Rd. W., Columbus, Ohio 43220
Filed Jun. 20, 1977, Ser. No. 808,024
Int. Cl.² B60K *31/00*
U.S. Cl. 180—105 E **13 Claims**



1. An apparatus for indicating the fuel economy of a vehicle, during acceleration comprising:

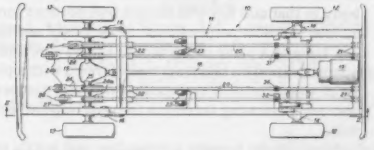
means for generating a vehicle acceleration signal having a magnitude proportional to the rate of change of speed of the vehicle;

means for generating a throttle rate signal having a magnitude proportional to the rate of change of the position of the vehicle throttle;

means responsive to said vehicle acceleration signal and said throttle rate signal for generating an efficiency signal having a magnitude proportional to the difference between the magnitudes of said vehicle acceleration signal and said throttle rate signal; and

indicator means responsive to said efficiency signal for indicating the fuel economy of the vehicle.

4,113,047
LEVER ASSEMBLIES FOR AUGMENTING PRIME MOVER POWER
Albert W. Turner, 1541 Hill Ave., Wheaton, Ill. 60187
Filed May 9, 1977, Ser. No. 794,971
Int. Cl.² B60L *11/18*
U.S. Cl. 180—65 D **3 Claims**



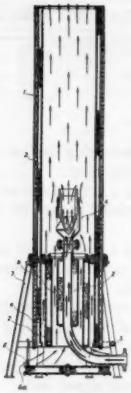
1. A lever system for augmenting power input to a prime mover including an automotive vehicle chassis driven by said prime mover which comprises longitudinally elongated levers pivotally mounted under the chassis, road engaging wheels mounted on the rear ends of said levers to tilt the levers as they ride over irregularities in the road bed traversed by said chassis, a fly wheel shaft on said chassis, links connecting said shaft with said levers to convert tilting motion of the levers into rotation of the shaft, and an electrical current generator driven by said fly wheel shaft.

4,113,048

METHOD OF AND DEVICE FOR ATTENUATING THE NOISE RADIATED BY GAS JETS

Constantin Teodorescu, Bucharest, Romania, assignor to Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst, Bucharest, Romania

Filed Apr. 21, 1976, Ser. No. 678,728
Claims priority, application Romania, Jun. 12, 1975, 82514
Int. Cl.[2] G10K *11/04;* F01N *1/04, 3/04;* F04F *5/44*
U.S. Cl. 181—220 5 Claims



1. A device for attenuating noise generated by a jet of expanding gas, comprising:

a nozzle having an axis and discharging a jet of expanding gas, said nozzle including:

an outer cylindrical tubular body having a plurality of first orifices;

an inner cylindrical tubular body coaxial with said outer body and spaced from said outer body to define an annular slot opening in the direction of flow of the gas passing axially between said bodies, said inner body having a first wall portion extending axially beyond said outer body and lying radially inwardly of a second wall of the inner body portion surrounded by said outer body so that said first and second wall portions form an annular shoulder perpendicular to the axis of said nozzle and lying in a plane of the mouth of said slot; and

a tapered portion on said inner body formed with a plurality of second orifices in alignment with said first orifices and communicating therewith through respective channels;

a cylindrical tubular housing surrounding said nozzle coaxially and open at both ends, said housing being lined with sound-absorbing material; and

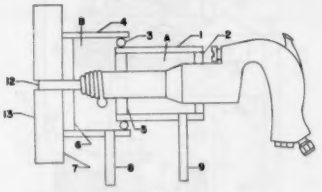
a conduit communicating with said outer body for feeding the gas through said annular slot, said gas expanding upon emergence from said slot at said mouth, impinging upon said first wall portion at an angle and spreading at an angle from the outer wall of said slot, and thereafter flowing along said first wall portion and beyond to entrain secondary air through said first orifices, said second orifices and the interior of said inner tubular body.

4,113,049

NOISE REDUCTION DEVICE FOR IMPACT TOOLS

Raymond S. Lieber, 1105 Alumni Ave., Las Cruces, N. Mex. 88003

Filed Apr. 14, 1976, Ser. No. 676,878
Int. Cl.[2] G10K *11/04;* E04B *1/99*
U.S. Cl. 181—230 4 Claims



1. A noise reduction device for use with a reciprocating impact tool comprising

a rigid cylinder;

resilient walls at both ends of said cylinder secured between said cylinder and the outer housing of said tool so as to provide a first compartment about said housing;

a second rigid cylinder having a larger diameter than said first rigid cylinder;

means for sealing one end of said second cylinder about the outer circumference of said first cylinder;

a resilient block having a substantially flat face;

an opening in said block for accepting the set of said impact tool, said set being in contact with said resilient block;

means for sealing said resilient block within the other end of said second cylinder; and

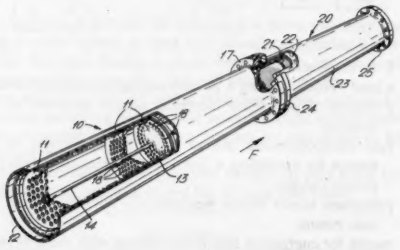
a conduit extending outwardly from said first and second compartments.

4,113,050

FLUID-FLOW NOISE REDUCTION SYSTEMS

Trevor Smith, Whitley Bay, England, assignor to British Gas Corporation, London, England

Filed Aug. 16, 1976, Ser. No. 714,984
Claims priority, application United Kingdom, Sep. 25, 1975, 39314/75
Int. Cl.[2] F01N *3/06, 1/08, 7/18*
U.S. Cl. 181—230 8 Claims



1. A gas-flow noise reduction unit comprising:

a cylindrical housing an upstream end for receiving a flow of gas and a downstream end for discharging said flow of gas;

means at said upstream and downstream ends for connection of said noise reduction unit in a gas flow conduit such that a flow of gas in said conduit passes through said reduction unit;

a plurality of circular plates located diametrically at prede-

termined spaced intervals along the length of the internal bore of the housing, each plate being formed with a plurality of orifices of predetermined size and constituting a pressure-reducing stage of the unit, each plate being positioned in groups of two or more plates with equal spacing between plates in each group, the spacing between each adjacent group of plates in the direction of flow from said upstream end of said unit to said downstream end thereof being of progressively increasing dimension and being sufficient to ensure that the kinetic energy in the jets of gas flowing through the orifices in each plate is dissipated before the gas reaches the next plate of the unit; and

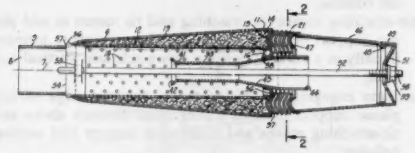
means for retaining the plates at said location within said housing.

4,113,051

ENGINE MUFFLER AND SPARK ARRESTER

Paul S. Moller, Dixon, Calif., assignor to Discojet Corporation, Davis, Calif.

Filed Oct. 4, 1976, Ser. No. 728,913
Int. Cl.[2] F01N *1/02, 3/02, 3/06*
U.S. Cl. 181—231 **6 Claims**



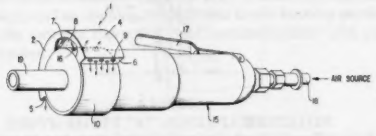
1. An engine muffler and spark arrester comprising an outer tube extending along an axis and having an inlet and an outlet; a partially toroidal end wall having an axial opening therein, said end wall engaging and seated against an end of said outer tube adjacent said outlet; a plurality of substantially identical, nested, partially toroidal cups disposed coaxially adjacent said end wall, each of said cups having in cross-section in a plane containing said axis a substantially S-shape with the radially inner edge of each of said cups directed toward said end wall and with the radially outer edge of each of said cups directed away from said end wall; a resonator-arrester chamber disposed coaxially with said cups and having an open end disposed against the end one of said cups and having a closed end disposed remote from said cups; and means for securing said outer tube, said cups and said resonator-arrester chamber together.

4,113,052

UNITARY ELASTIC MUFFLER ASSEMBLY FOR A PNEUMATIC DEVICE

John O. McElroy, Jr., Pottstown, Pa., assignor to Berkmont Industries, Boyertown, Pa.

Filed Dec. 13, 1976, Ser. No. 750,330
Int. Cl.[2] F01N *1/08*
U.S. Cl. 181—230 **9 Claims**



1. A unitary, elastic muffler assembly adapted for telescopic engagement with the tubular housings of variously sized pneumatic devices exhausting spent working fluid from vents in a discrete peripheral segment thereof, comprising:

a. an arcuate, channel-shaped, sound-muffling section terminating at opposite end walls bridged by elastic band means, said sound-muffling section having a central fluid receiving area comprising a minor arcuate segment of the sound-muffling section and having fluid exhaust ports in said opposite end walls, said central fluid receiving area dividing said spent working fluid into two oppositely directed arcuate fluid flow paths;

b. sound-attenuating material substantially filling said arcuate, channel-shaped, sound-muffling section; and

c. baffle structures extending between side walls of said sound-muffling section;

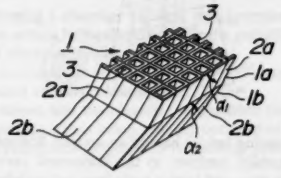
whereby, upon telescoping said assembly over the tubular housing of a pneumatic device, said arcuate, channel-shaped, sound-muffling section defines, with the tubular housing, two arcuate, sound-muffling, oppositely directed fluid flow paths divided from said central fluid receiving area through said sound-attenuating material and through said baffle structures to said exhaust ports in said opposite end walls.

4,113,053

SOUND ABSORBING BODY

Masayasu Matsumoto, Zushi; Kazuyoshi Iida, Yokohama; Yoshikazu Kondo, Yokohama, and Shosuke Suzuki, Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 6, 1976, Ser. No. 730,115
Int. Cl.[2] E04B *2/00;* **G10K** *11/00*
U.S. Cl. 181—284 **5 Claims**



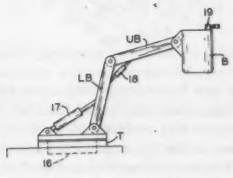
1. A sound absorbing body comprising, a plurality of sound absorbing bodies superimposed one upon the other and each provided with a number of sound absorbing cavities inclined at an angle which is less than 80° with respect to a transverse horizontal sectional plane, the sound absorbing cavities of adjacent sound absorbing bodies being inclined at angles with respect to said transverse horizontal sectional plane which are different from each other, said sound absorbing cavities being opened at a sound incident surface and closed at base portions thereof.

4,113,054

FLUID CONTROL SYSTEM FOR MOBILE AERIAL TOWERS

Lester L. Myers, Fort Wayne, Ind., assignor to Mobile Aerial Towers, Inc., Fort Wayne, Ind.

Filed Apr. 1, 1977, Ser. No. 783,938
Int. Cl.[2] B66F *11/04;* **F16D** *31/02*
U.S. Cl. 182—2 **34 Claims**



1. A mobile aerial tower comprising:

a personnel bucket,

a plurality of fluid operated positioning elements including first and second interconnected boom means one of which is connected to said bucket for positioning the same and turntable means connected to at least one of said boom means for rotating said boom means about an upright axis,

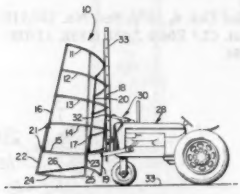
first and second variable speed pumps, and

selectively actuatable valve means for operatively connecting said first and second pumps respectively simultaneously to any two of said positioning elements or alternatively operatively connecting said first and second pumps simultaneously to any one of said positioning elements or alternatively operatively connecting either said first or second pump to any one of said positioning elements.

4,113,055
TREE LADDER

Frederick M. Gleockler, R.D. 1, Box 35, and Robert G. Gleockler, R.D. 1, Box 38, both of Ridgely, Md. 21660

Filed Apr. 27, 1977, Ser. No. 791,465
Int. Cl.[2] E06C *5/06, 1/24*
U.S. Cl. 182—63 8 Claims

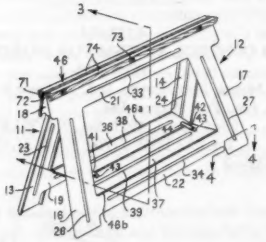


1. A harvesting ladder having an arcuate horizontal curvature to generally conform to the horizontal curvature of a segment of a tree, said ladder including end uprights, a plurality of integral curved rungs each connected at their ends to each of said uprights, and an intermediate upright connected to said rungs.

4,113,056
FOLDABLE SAW HORSE

Mario M. DeLorenzo, P.O. Box 203, Glen Ellen, Calif. 95442

Filed Jan. 28, 1977, Ser. No. 763,368
Int. Cl.[2] F16M *11/00*
U.S. Cl. 182—153 8 Claims

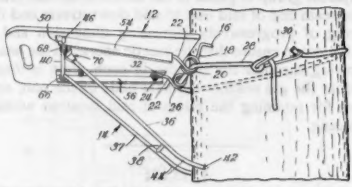


1. A foldable saw horse comprising a pair of similar stampings hingedly connected together at the tops thereof forming an elongated supporting surface and each defining a pair of legs at opposite ends thereof, upper and lower struts intermediate the top and bottom of each of said pair of stampings and spanning the defined legs thereof, and a pair of shelf sections hingedly secured together and spanning the lower struts to which each shelf section is hingedly connected.

4,113,057
PORTABLE SUPPORT

Max E. Bessinger, R.R. 3, Box 415, Three Rivers, Mich. 49093

Filed Mar. 24, 1977, Ser. No. 780,606
Int. Cl.[2] A47C *9/10;* A47F *5/12*
U.S. Cl. 182—187 30 Claims



1. A portable support adapted to be attached to a vertical column and, when so attached, to function as a seat, a tree stand, a table, or the like, which comprises:

a planar support member;

tie means for tying said planar support member to said vertical column;

tie-attaching means for attaching said tie means to said planar support member with said planar support member initially in a vertical position along side said vertical column;

column engaging means located at the rear edge of said planar support member a substantial distance above said tie-attaching means and adapted to engage said vertical column;

spring means interposed between said tie means and said engaging means;

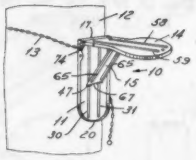
said spring means being adapted to be biased in spring-loaded position by the rotation of said planar support member toward a horizontal position whereby the planar support member, while in raised position, is constantly urged by the bias of said spring means to rotate toward the initial position along side the vertical column; and

brace means for holding said planar support member in horizontal position, said brace means being adapted to engage said vertical column and to be held in engagement with said vertical column by the tendency of said planar support member to rotate toward said vertical column under the influence of said spring means.

4,113,058
PORTABLE SEAT FOR HUNTERS

Harry J. Kobosh, 12890 - 25 Mile Rd., Utica, Mich. 48087

Filed Apr. 3, 1975, Ser. No. 564,744
Int. Cl.[2] E04G *3/00*
U.S. Cl. 182—187 7 Claims



1. A collapsible seat device for attachment to a tree comprising a body member for engaging the tree trunk to extend vertically, a seat member of similar size hingedly connected at one end of said body member to form a thin package and adapted to open to extend horizontally, a brace hinged to the inside of one of said members, a stop on the inside of the other of said members for receiving the free end of said brace, said brace being of a fixed non-adjustable length less than the length

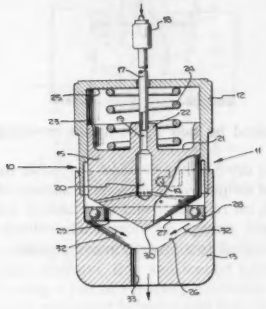
of the closed package to be fully contained therein when closed, the hinged end being so located on said seat member that the seat is approximately horizontal when the brace engages said stop, and a link chain for wrapping around said tree trunk with the ends attached to said body member below said hinged connection with said seat member, said attachment being at the upper corners of said vertical body member, in which said brace is hinged to said seat member and the stop is on said body member, one of said upper corners of said vertical body member having a slot through which one end link of said chain projects, means for anchoring said projecting end to the trunk-engaging side of said body member while the remainder of the chain is carried within said closed thin package.

4,113,059

HAND HELD DEVICE FOR PACKING GREASE INTO WHEEL BEARINGS

Ognian Markovski, 2715 Jalmia Dr., West Hollywood, Calif. 90046

Filed Mar. 4, 1977, Ser. No. 774,324
Int. Cl.[2] F01M *11/00*
U.S. Cl. 184—1 D **8 Claims**



6. A hand-held device for greasing a wheel bearing comprising:

a main housing portion;

a separable lower housing portion having an inner surface forming a generally fluid-tight chamber between said main housing portion and said lower housing portion;

a spring-biased piston mounted in said main housing portion having a generally conically shaped lower portion having an apex configured similarly to a conically-shaped portion on the inner surface of said lower housing portion;

a grease inlet having an opening leading into said upper housing portion;

a fluid conduit through said piston in fluid communication with said grease inlet;

a plurality of spaced ports opening exteriorly of said piston above the apex of said conical portion of said piston in fluid communication with said fluid conduit through said piston; and an opening through said lower housing portion to the exterior thereof in fluid communication with said chamber.

4,113,060

DRIVE SHAFT "U" JOINT LUBRICATOR

Roy B. Smith, 3480 NE. 62, Washington Ct. House, Ohio 43160

Continuation-in-part of Ser. No. 635,439, Nov. 26, 1975, Pat. No. 4,040,504. This application Jun. 20, 1977, Ser. No. 807,984
Int. Cl.[2] F16N *13/22*
U.S. Cl. 184—6 **10 Claims**

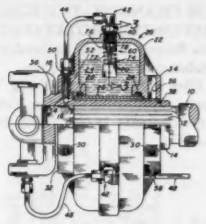
1. In the combination of a shaft rotatable about an axis and automatic lubrication apparatus for lubricating parts rotating with the shaft,

the lubrication apparatus including a reservoir adapted to store a lubricant,

said reservoir being defined by means forming a fluid tight rigid annular enclosure of constant volume removably rigidly mounted coaxially with and on the periphery of said shaft,

at least one aperture through the surface of the annular enclosure,

conduit means connected between said aperture and a bearing surface for conducting lubricant from said reservoir to said bearing surface, said bearing surface and conduit being connected to rotate with said shaft,



valve means mounted adjacent said aperture for allowing lubricant to flow only out of the reservoir into the conduit,

means forming a chamber adjacent said aperture,

said valve means being disposed near the radially outer end of said chamber means,

a piston mounted to reciprocate within said chamber means and biased radially inwardly,

opening means into the chamber means from the reservoir, said opening means being radially outward of said piston where said piston is biased to its radially innermost position,

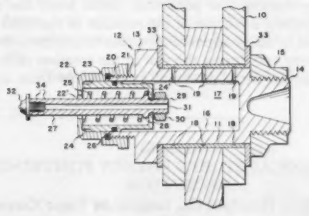
a mass mounted to move with the said piston to drive said piston radially outward upon rotation of said shaft.

4,113,061

AUTOMATIC LUBRICATOR

Bertram Anthony Peaster, Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Jan. 17, 1977, Ser. No. 759,756
Int. Cl.[2] F16N *11/04, 11/10*
U.S. Cl. 184—41 **4 Claims**



1. An automatic lubricator to provide a lubricant to faying surfaces of relatively moving structural members interconnected by a mounting bolt comprising:

a chamber in the form of an axial bore in said bolt adapted to contain the selected lubricant;

an inlet to said chamber including a one-way valve to permit the filling of said chamber with said lubricant and its retention therein;

at least one passage between said chamber and the faying surfaces aforesaid;

a piston in the form of a cup opening adjacent the head end of said bolt slideable in said chamber and being normally forced to one end thereof by the lubricant acting against one side of said piston;

a rod connected to and extending from said piston through said bolt, said rod being bored axially constituting the inlet aforesaid; and

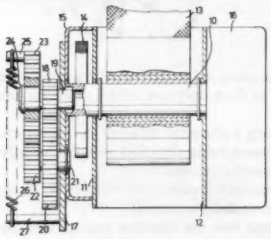
pressure producing means constantly operative on and against the other side of said piston tending to move it to the other end of said chamber against the resistance therof by the lubricant.

4,113,062

DEVICE FOR CHANGING THE FORCE ACTING ON A REVERSIBLY ROTATABLE SHAFT

Stig Gösta Bele Beland, Södertälje, Sweden, assignor to Gränges Essem Aktiebolag, Vesteras, Sweden

Filed Feb. 3, 1977, Ser. No. 765,282
Claims priority, application Sweden, Feb. 3, 1976, 7601103
Int. Cl.[2] B65H *75/42, 75/48;* F03G *1/08*
U.S. Cl. 185—10 **7 Claims**



1. Device for changing the force gradient acting on a reversibly rotatable shaft connected with a spring which is arranged to be tensioned during the rotation of the shaft in one direction and which then provides the rotation of the shaft in the opposite direction, comprising

a rotatably mounted means, a second spring to actuate said rotatable means,

a gear reduction device which is connected between the shaft and the rotatable means, said gear reduction device connecting the shaft with the rotatable means to cause the rotatable means to rotate less than one revolution during the whole rotation of the shaft in one direction, the second spring being arranged to provide an additional force on the shaft by way of the gear reduction device, and

means for causing the additional force from the second spring during a portion of the rotation of the shaft in one direction to act in opposite direction to the force from the first spring and during the rest of the rotation of the shaft to act in the same direction as the force from the first spring.

4,113,063

MECHANICAL STORED ENERGY POSITIONING ACTUATOR

M. Frank Troy, Hinsdale, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Dec. 6, 1976, Ser. No. 748,058
Int. Cl.[2] F03G *1/00*
U.S. Cl. 185—40 R **14 Claims**

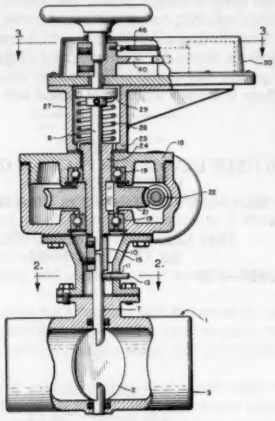
1. In a rotary mechanical valve actuator having a reversible drive motor, and a torque multiplier for furnishing in non-overlapping sequence, load and storage torque to an output shaft;

means storing in a predetermined amount of drive motor energy and torque intermediate said multiplier and output shaft during prescribed motion relative said multiplier and shaft;

means limiting output shaft travel and torque, providing said relative motion in one direction thereby storing said predetermined energy;

means signaling output shaft travel;

means actuated by said signal selectively and releasably locking said multiplier and shaft to limit said relative motion and retain said stored energy;



means actuated by said signal means reversing the drive motor;

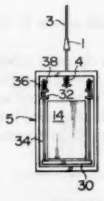
wherein the drive motor provides reversible rotary output shaft load torque over a prescribed amount of shaft rotation, and, on release of said latch and/or loss of motor torque said storage provides unidirectional torque, to return the shaft to a predetermined position.

4,113,064

ELEVATOR CAR MOUNTING

Masayuki Shigeta, Katsuta, and Tadashi Shibata, Ibaraki, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 29, 1973, Ser. No. 420,050
Claims priority, application Japan, Dec. 1, 1972, 47-119844
Int. Cl.[2] B66B *11/02*
U.S. Cl. 187—1 R **24 Claims**



1. An elevator device for an elevator of the type comprising a car for carrying passengers or freight mounted in a framework hung by a wire rope and guided by guide means in its movement along guide rails fixed to a shaft, said elevator device being characterized in that means are provided for suspending said car in said framework to be freely swingable relative to the framework in at least a horizontal direction normal to the plane in which the framework is disposed.

4,113,065

SCISSORS LIFT

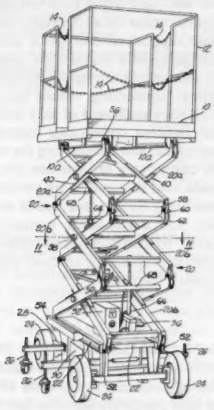
Bert J. Sikli, Venice, Calif., assignor to Robert Staines, Paramount, Calif.

Continuation of Ser. No. 594,103, Jul. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 542,508, Jan. 20, 1975, Pat. No. 3,983,960, which is a continuation-in-part of Ser. No. 406,260, Oct. 15, 1973, abandoned. This application Mar. 28, 1977, Ser. No. 781,545

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.[2] B66B *11/04;* E04G *1/22*

U.S. Cl. 187—18 43 Claims



20. A load lifting scissors lift assembly comprising: a base frame, an upper platform, first and second pairs of crossed lever arms forming a pair of vertically-extensible parallel scissor-type linkages interposed between said base frame and said upper platform, said lever arms of said linkages being operatively coupled to said base frame and said platform to enable vertical shiftable movement of said platform relative to said base frame, an extensible drive unit, means for operatively coupling said drive unit to said first and second pairs of crossed lever arms, said means for operatively coupling comprising at least one transverse means extending between each arm of said first pair of lever arms and at least one second transverse means extending between each arm of said second pair of lever arms, a first connecting means comprising a first saddle structure pivotally connected to one end of said drive unit and also being operatively pivotally connected to said first transverse means, and a second connecting means pivotally connected to the other end of said drive unit and also being operatively pivotally connected to the second of said transverse means, said first and second connecting means being located relative to said first and second pairs of crossed lever arms to enable said drive unit to remain in substantially the same position in space relative to movement of said lever arms during their vertically extensible movement.

4,113,066

ELEVATOR CONTROL APPARATUS HAVING A NOVEL HALL CALL ALLOTTING DEVICE

Kenji Yoneda; Masao Nakazato, and Takeo Yuminaka, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 2, 1976, Ser. No. 702,145

Claims priority, application Japan, Jul. 2, 1975, 50-80814

Int. Cl.[2] B66B *1/18*

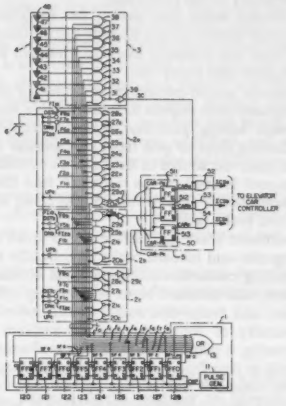
U.S. Cl. 187—29 R 14 Claims

1. A control circuit for allotting hall calls to elevator cars in an elevator system comprising:

generator means for generating a scanning signal which consists of a plurality of scanning pulses,

hall call detector means for generating a signal when the number of the floor where a hall call occurs is equal to the number represented by said scanning signal,

a plurality of elevator car detectors each provided for a corresponding elevator car, each of which generates a signal when the number of the floor where the elevator car is located is equal to the number represented by said scanning signal,



memory circuit means for generating pulse signals, each of which is generated upon appearance of a signal from one of said elevator car detectors and remains until appearance of the next signal from another of said elevator car detectors, and

an allotting circuit having a plurality of detecting means, each of which generates an allotted hall call signal for corresponding elevator cars when the pulse from said hall detector means is supplied thereto simultaneously with the pulse signal from said memory circuit means.

4,113,067

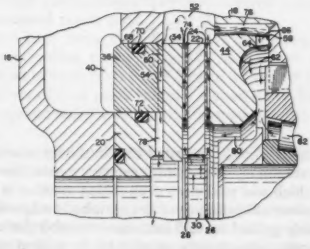
COOLING FLUID CIRCULATION IN AN ANNULAR DISC BRAKE

Robert R. Coons, Indian Head Park; Richard G. Hennessey, Oak Lawn, both of Ill., and John Woffenden, Rotherham, England, assignors to International Harvester Company, Chicago, Ill.

Filed Jun. 30, 1977, Ser. No. 811,499

Int. Cl.[2] F16D *65/84*

U.S. Cl. 188—71.6 4 Claims



1. A disc brake operating in a fluid environment comprising:

a housing, including a brake disc operating cavity including an annular fluid passage;

a reservoir source of fluid contained in said housing;

a rotatable shaft carried in said housing;

a brake disc including radial braking surfaces slideably carried on said rotatable shaft for rotation therewith, said brake disc partially submerged in said reservoir source of fluid, said brake disc having means to pump said fluid by centrifugal force from the radial surfaces of said brake disc to said annular fluid passage said annular fluid passage being located immediately circumferential to the outer periphery of the brake disc;

an inboard brake ring having flat surfaces on both sides thereof carried in said housing circumferentially disposed around said rotatable shaft, said inboard brake ring being adjacent said brake disc;

an annular piston carried in said housing circumferentially disposed with respect to said rotatable shaft, said annular piston having plurality of communication notches for allowing fluid to pass from said annular fluid passage to sid reservoir source of fluid and a circumferential annular channel formed in the outboard face thereof, said outboard face of said annular piston being adjacent said inboard brake ring;

an outboard brake ring adjacent said brake disc on the side opposite said inboard brake ring, fixedly mounted in said housing circumferentially disposed around said rotatable shaft, said outboard brake ring having a flat surface adjacent said brake disc and a contoured surface having a plurality of force transmission surfaces engaging said housing, a plurality of fluid access channels for allowing fluid to pass from said annular fluid pasage to said reservoir source of fluid and an annular depression therein;

whereby said communication notches in said annular piston and said fluid access channels in said outboard brake ring provide egress for fluid pumped into said annular fluid passage of said housing by said brake disc thereby allowing circulation of cooling fluid past said brake disc.

4,113,068

HYDRAULICALLY OPERATED DISC BRAKES

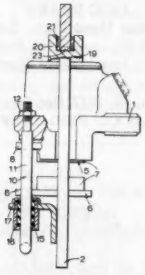
John Charles Ford, West Midlands, England, assignor to Girling Limited, Birmingham, England

Filed May 21, 1976, Ser. No. 688,914

Claims priority, application United Kingdom, May 29, 1975, 23525/75

Int. Cl.[2] F16D *55/228*

U.S. Cl. 188—72.5 **14 Claims**



1. An hydraulically operated disc brake for a vehicle comprising a stationary drag-taking member, a rotatable disc adjacent to which said stationary drag-taking member is located, a yoke member extending over the peripheral edge of said disc and slidably guided on said stationary member for movement in a direction substantially parallel to the axis of said disc, a directly actuated friction pad assembly positioned adjacent to said stationary member for engagement with one side of said disc, an indirectly actuated friction pad assembly for engagement with the other side of said disc, an hydraulic actuator in said stationary member comprising oppositely acting first and second pistons, said first piston acting on said directly actuated friction pad assembly and said second piston acting through said yoke member on said indirectly actuated friction pad assembly, there being no direct engagement between said yoke and said stationary member for preventing movement of said yoke radially of the disc, drag on said indirectly actuated friction pad assembly being transmitted to said stationary member substantially solely through said yoke member, means for locating said friction pad assemblies against movement in a radial direction comprising a retainer extending between said stationary member and said yoke member, first and second axially spaced support means for supporting said yoke member comprising the sole support of said yoke member, said first support means consisting of a connection between said yoke member and said second piston, said second support means consisting of resilient connecting means between said yoke member and said retainer outboard of said indirectly actuated pad assembly, said resilient connecting means comprising at least one elastomeric bush and a mounting for said bush on said yoke, said retainer comprising at least one pin portion having first and second ends, said first end being received in said bush, and said second end being rigidly received in an opening in said stationary member, and a releasable connection detachably securing said retainer to said stationary member for locating said retainer against movement in an axial direction with respect to said stationary member.

4,113,069

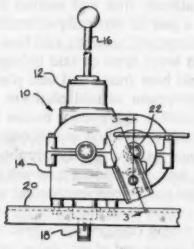
SMALL TRANSMISSION WITH BRAKE

Jacob A. Craft, 9376 Mt. Gilead Rd., and Hans Hauser, 12336 Hilltop Dr., both of, Fredericktown, Ohio 43019

Filed May 26, 1977, Ser. No. 800,932

Int. Cl.[2] F16D *55/02*

U.S. Cl. 188—72.7 **4 Claims**



1. In combination, a transmission housing, an output shaft extending out of said housing, a brake element rotatable with said output shaft, a first brake puck, said housing having a recess with an open side facing away from said output shaft holding said first brake puck, said housing also forming a shoulder adjacent the open side of said recess, a supporting bolt secured to said housing and extending outwardly therefrom near said recess and said shoulder and outside the periphery of said brake element, second brake puck means, a stationary brake puck holder mounted in a fixed position on said bolt, said holder having an opening receiving said second brake puck means, said holder having a shank spacing said holder from said housing and engagable with a portion of said puck at the open side of said recess to retain said first puck in said recess, said shank also having a surface bearing against said housing shoulder to prevent said holder from pivoting on said bolt, a brake lever pivotally mounted on said bolt on the side of said holder opposite said brake element, and means connected between said brake lever and said second brake puck means for moving said second brake puck means towards said brake element and said first puck when said lever is moved.

4,113,070

BRAKE ACTUATOR

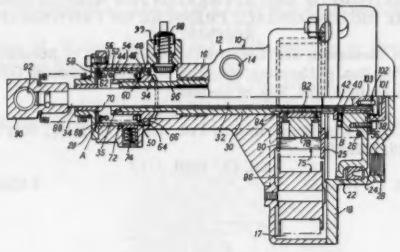
Philip Norman Paginton, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., London, England

Filed Jul. 15, 1977, Ser. No. 816,133

Claims priority, application United Kingdom, Aug. 11, 1976, 33701/76

Int. Cl.[2] F16D 65/56

U.S. Cl. 188—196 F 6 Claims



6. A brake actuator comprising: a variable volume chamber having a wall member movable by a fluid pressure medium; an elongate plunger longitudinally movable by said member and comprising two mutually screw-threaded parts arranged to vary the effective or overall length of the plunger upon relative rotation of said two parts; a tensator comprising two oppositely coiled spring portions to effect said relative rotation, one portion being coupled to one of the screw-threaded parts for rotatably driving it relative to the other of the screw-threaded parts in a direction to increase said effective or overall length of the plunger; and rotation preventing means coupled to said one part and releasable when the stroke of the plunger exceeds a predetermined or pre-set amount to permit torque transmission from the tensator to said one part to drivingly rotate the latter in said direction.

4,113,071

STAY

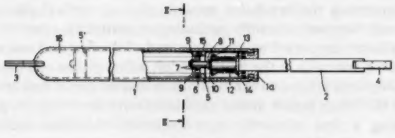
Hans Müller, Wolfsburg, and Georg Hanke, Hattorf, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Nov. 30, 1976, Ser. No. 746,101

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2555062

Int. Cl.[2] F16F 9/34

U.S. Cl. 188—282 5 Claims



1. A stay for use with a cover or the like and comprising:

(a) a cylinder for containing a pressure fluid medium and having a sealing arrangement at one end thereof;

(b) a piston rod arranged for movement through said sealing arrangement into and out of said cylinder and having an interior end within said cylinder;

(c) a piston carried by said piston rod and slidably arranged within said cylinder, said piston being mounted on said piston rod, for axial displacement relative thereto and having opening means for allowing the flow of the pressure fluid medium through said piston;

(d) first abutment means arranged in the region of said interior end of said piston rod and second abutment means spaced from said first abutment means, said first and second abutment means being on said piston rod, said piston being arranged between said first and second abutment means such that said first and second abutment means limit the axial displacement of said piston with respect to said piston rod;

(e) a cover element mounted on said piston rod for axial displacement relative thereto and being adapted to close said opening means of said piston;

(f) spring means having one end coacting with said cover element for biasing the same toward said piston such that said cover element closes said opening means of said piston while said piston and piston rod are stationary and said piston is in a position wherein it is displaced toward said second abutment means; said piston, said first and second abutment means, said cover element and said spring means being arranged such that said piston is axially freely displaceable between said first and second abutment means without being under the influence of said spring means;

(g) third abutment means, arranged on said piston rod next to said second abutment means, for limiting the movement of said cover element toward said interior end of said piston rod; and

(h) fourth abutment means on said piston rod, the other end of said spring coacting with said fourth abutment means as well as with said sealing arrangement.

4,113,072

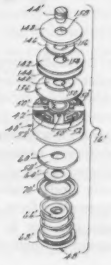
PISTON VALVE ASSEMBLY FOR A SHOCK ABSORBER

Dale A. Palmer, Monroe, Mich., assignor to Monroe Auto Equipment Company, Monroe, Mich.

Continuation of Ser. No. 668,915, Mar. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 542,617, Jan. 20, 1975, Pat. No. 3,945,474. This application Sep. 1, 1977, Ser. No. 829,954

Int. Cl.[2] F16F 9/34

U.S. Cl. 188—282 9 Claims



1. A shock absorber piston construction comprising,

a piston body having means thereon connected to one end of an associated piston rod,

said piston body being formed with first and second sets of axially extending, circumferentially spaced flow ports,

said first set of flow ports being greater in number than said second set of flow ports and said second set of flow ports being spaced radially outwardly from said first set of flow ports,

a first annular axially extending valve seat being coaxial with said body on one side thereof adjacent said first set of flow ports,

a first valve member engageable with said first valve seat to block fluid flow through said first set of flow ports,

a plurality of circumferentially spaced valve seats on the opposite side of said piston body,

said plurality of valve seats defining radial flow paths there-

between which are communicable with said first set of flow ports,

said valve seats defining individual chambers at the ends of said second set of flow ports, each of said chambers being larger in cross-sectional area than the associated flow port terminating therein, with the sum of the cross-sectional areas of said chambers being of a predetermined ratio with respect to the sum of the cross-sectional areas of said second set of flow ports,

a second valve member in the form of a flat annular valve disc extending radially of said body directly adjacent said plurality of valve seats and engageable therewith to block fluid flow through said second set of flow ports,

said second valve member being movable between a first position permitting a first magnitude of fluid flow through said second set of flow ports and a second position permitting a second magnitude of fluid flow through said second set of flow ports, and

at least one spring disc disposed on the axially opposite side of said second valve member from said piston body for resisting movement of said second valve member from said first position toward said second position.

4,113,073

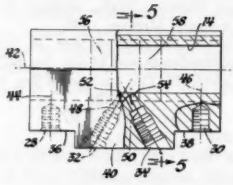
WHEEL CYLINDER

George Lusa, Dayton, and Thomas P. Mathues, Miamisburg, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 23, 1977, Ser. No. 836,140

Int. Cl.² F16D *65/24*

U.S. Cl. 188—364 **1 Claim**



1. In a brake wheel cylinder assembly comprising a cylinder body having a cylinder bore formed therein, opposed wheel cylinder pistons reciprocably received in said cylinder bore and having an expander spring therebetween, said pistons having sealing cups on their adjacent ends so that said cups and said cylinder bore define a pressure chamber in which said expander spring is located, a wheel cylinder boot on either end of said wheel cylinder body sealing the cylinder ends, and wheel cylinder pins extending from said cylinder bore with one end of each pin engaging one of said pistons to be moved thereby, said pins extending through said boots; the improvement wherein:

said cylinder body including one tangentially, integrally extending block-like step on one side thereof extending axially parallel to the axis of said bore and extending from about one-fourth of the circumference of the cylinder body, said body being formed from a constant cross section extrusion along the entire extrusion length with a bore surface finish resulting from the extrusion process requiring no further machining operation to provide a bore surface which seals pressures delivered to said pressure chamber and which is sufficiently fine to accommodate reciprocal movements of said pistons and sealing cups without injury thereto;

said block-like step having wheel cylinder assembly mounting holes formed therein adjacent the ends thereof and extending substantially perpendicular but skew to the bore axis, said step further having inlet port and bleeder screw holes formed therein between said mounting holes and in substantially linear alignment therewith along one face of said step, said inlet port and bleeder screw holes having their axes extending angularly toward the bore axis and screw thereto so that they open into said pressure chamber on a minor chord and at axially located points so closely axially centered in said pressure chamber that they are not engaged by said cups during wheel cylinder operation.

4,113,074

METHOD OF AND APPARATUS FOR REGULATING THE BRUSH CONTACT PRESSURE OF PANTOGRAPH ASSEMBLIES

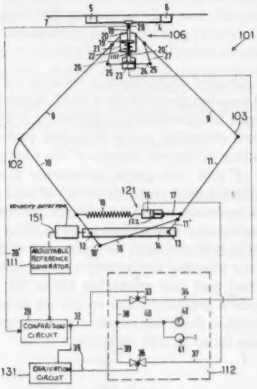
Karl Stemmann, and Gerhard Holtmeier, both of Schuettorf, Fed. Rep. of Germany, assignors to August Stemmann OHG, Schuettorf, Fed. Rep. of Germany

Filed May 20, 1976, Ser. No. 688,269

Claims priority, application Fed. Rep. of Germany, May 23, 1975, 2522876

Int. Cl.² B60L *5/12*

U.S. Cl. 191—67 **8 Claims**



1. In a pantograph assembly supportable on an electric vehicle and associated with a brush adapted for wiping contact with an overhead conductor to convey drive power to the vehicle, the assembly comprising a frame including at least one scissor member having a first and a second rod disposed in a vertical plane, a lower end of the first rod being linked to an upper end of the second rod so that an upper end of the first rod moves in a vertical plane when a lower end of the second rod is moved along a horizontal path, a brush support assembly supporting the brush for movement in a vertical plane, the brush support assembly including a vertically oriented first cylinder supported by the upper end of the first rod and a first piston movable in the first cylinder, a first piston rod having a lower end affixed to the first piston and an upper end coupled to the brush sensor means associated with the brush for generating a first relatively high-frequency electrical indication proportional to variations in the instantaneous contact pressure of the brush on the overhead conductor, means for generating a variable second reference electrical indication indicative of a desired value of such contact pressure, comparison means coupled to the sensor means and to the second indication-generating means for generating a third indication proportional to the difference between the first and second indications, first control means coupled to the output of the comparison means for incrementally moving the first piston in accordance with changes in the third indication to compensate for changes in the contact pressure of the brush on the overhead conductor, means coupled to the output of the comparison means and responsive to the third indication for deriving a

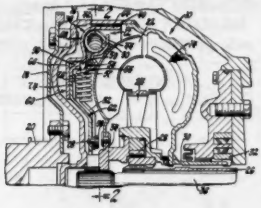
relatively low-frequency fourth indication therefrom, a second horizontally disposed cylinder carried by the vehicle, a second piston movable within the second cylinder, a second piston rod coupled to the second piston for imparting horizontal movement to the lower end of the second rod of the scissor member, and second control means coupled to the output of the deriving means for incrementally moving the second piston in accordance with changes in the fourth indication.

4,113,075

CENTRIFUGAL LOCK-UP CLUTCH AND TORQUE CONVERTER

Frank H. Walker, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 20, 1977, Ser. No. 798,768
Int. Cl.[2] F16H *41/18*; F16D *43/14*
U.S. Cl. 192—3.31 **2 Claims**



1. A centrifugal lock-up clutch and torque converter comprising; torque receiving input means including an input shell and a fluid impeller; torque delivery output means including a fluid turbine; clutch shoe means having leading and trailing edges disposed between said turbine and said input shell and being operable to frictionally engage said input shell in response to centrifugal forces thereon; drive spring means drivingly connected in a generally circumferential direction between said clutch shoe means and said turbine and being effective to transmit rotation to said clutch shoe means from said turbine prior to engagement and being resiliently effective to transmit drive torque from said input shell to said turbine after engagement of said clutch shoe means while permitting relative angular movement between the clutch shoe means and said turbine due to compression of said drive spring means while said clutch shoe means is engaged; clutch engagment control spring means operatively connected in a generally radial direction between said clutch shoe means and said turbine and applying a force therebetween resiliently resisting movement of said clutch shoes radially toward said input shell until the clutch shoe means frictionally engages the input shell and relative angular movement in the direction of input shell rotation between the clutch means and turbine occurs, the relative angular movement resulting in a reversal of force in said clutch engagement control spring means so as to increase the engagement force at the trailing edge of the clutch shoe means; and energy dissipating friction means operatively connected between the clutch shoe means and the turbine to dampen torsional vibrations.

4,113,076

INTERRELATED CONTROLS FOR VEHICLE BRAKES, TRANSMISSION AND MOTOR

Arthur L. Lee, and Arthur B. Coval, both of Columbus, Ohio, assignors to A. L. Lee Corporation, Columbus, Ohio

Filed Jul. 6, 1976, Ser. No. 702,396
Int. Cl.[2] B60K *29/00*
U.S. Cl. 192—4 A **6 Claims**

1. A brake actuator for a vehicle comprising,

propelling means for said vehicle,

fluid pressure operated control means connected to said propelling means, said fluid pressure operated control means arranged when subjected to fluid under pressure to be connected to said propelling means,

fluid actuated brake means for engaging said propelling means and braking said vehicle,

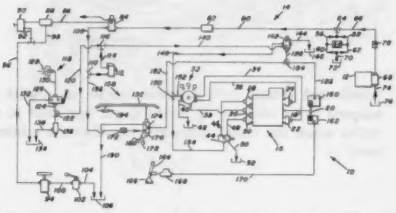
a source of fluid under pressure,

a brake actuator valve,

a fluid circuit for controlling the flow of fluid under pressure beween said source of fluid under pressure to said brake actuator valve, fluid actuated braking means, and said fluid pressure operated control means,

said brake actuator valve arranged in a brake disengaged position to supply said fluid actuated braking means with fluid under pressure from said source and maintain said fluid actuated braking means in a disengaged position,

said brake actuator valve arranged in a brake engaged position to vent said fluid under pressure from said fluid actuated braking means and vent said fluid under pressure from said pressure operated control means so that upon engagement of said fluid actuated brake means said fluid pressure operated control means is disengaged from said propelling means,



a brake actuator lever connected to said brake actuator valve, said brake actuator lever arranged to manually actuate said brake actuator valve and vent fluid under pressure from said fluid actuated braking means and said fluid pressure operated control means, and

a brake reset lever connected to said brake actuator valve, said brake reset lever movable to a brake engaged position upon engagement of said fluid actuated braking means to maintain said brake in an engaged position upon release of said brake actuator lever.

4,113,077

MARINE PROPULSION CONTROL SYSTEM WITH ENGINE IDLE BOOST

John M. Phinney, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 715,680, Sep. 19, 1976. This application Jan. 14, 1977, Ser. No. 759,390
Int. Cl.[2] F16D *67/00*
U.S. Cl. 192—.098 **4 Claims**

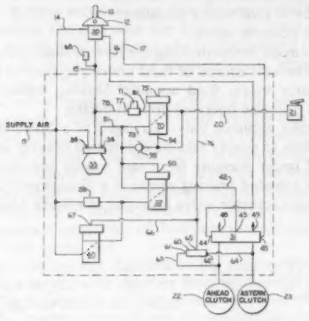
1. In a pneumatic clutch control system for a marine propulsion system having a prime mover controlled by a throttle speed governor, a drive train for transmitting power from the prime mover to a propeller drive shaft, an air inflatable clutch for selectively connecting the prime mover to said drive train, throttle means for actuation of the propulsion system, and inflation means responsive to movement of said throttle means for inflating said clutch and including a valve responsive to said throttle means and connected to a source of pressurized air to provide an air output signal at a pressure proportional to throttle position, the combination therewith of:

a governor control valve having a first inlet connected to receive said air output signal, a second inlet, and an outlet connected to said throttle speed governor; and

pressure regulator means connected to receive said air output signal and to pass the same to said second inlet of said governor control valve, said regulator means being adjust-

able to limit the maximum pressure which it passes to said governor valve,

said governor valve being normally biased to a position in



which said second inlet is connected to said outlet and adapted to be actuated to connect said first inlet to said outlet when the clutch pressure rises above a minimum level.

4,113,078

DRIVEN PLATES FOR FRICTION CLUTCHES

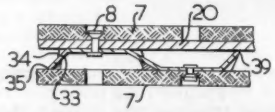
Ian Commander Maycock, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed May 17, 1977, Ser. No. 797,768

Claims priority, application United Kingdom, May 20, 1976, 20800/76

Int. Cl.² F16D *13/64*

U.S. Cl. 192—107 C **8 Claims**



1. A driven plate for a friction clutch of a vehicle comprising:

a hub member;

an annular plate member connected to and disposed around the hub member;

a plurality of resilient cushioning elements secured to and in circumferential array around the plate member;

and a pair of annular friction facings attached one either side to the resilient cushioning elements so that the friction friction facings are held generally parallel to each other and the two opposing back faces of the friction facings which are adjacent the resilient cushioning elements define two parallel faces;

wherein each cushioning element comprises:

at least one generally circumferentially extending operative resilient portion which extends between two parallel abutment surfaces associated with the parallel back faces of the friction facings and which tapers from a greater width at its radially inner end to a smaller width at its radially outer end.

4,113,079

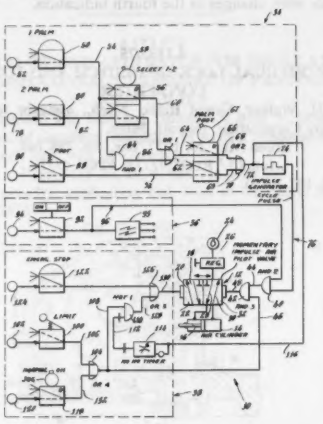
PRESS BRAKE CONTROL CIRCUIT

John T. Wright, Cattaraugus, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Filed Dec. 23, 1976, Ser. No. 753,647

Int. Cl.² F16P *3/22*

U.S. Cl. 192—129 B **9 Claims**



1. A control circuit for operating a clutch to engage the drive of a press comprising:

motor means for engaging and releasing said clutch,

first logic circuit means responsive to an input signal from a first, second, and third switch means to actuate said motor means to engage said clutch, and

second logic circuit including means responsive to a second input signal from said third switch means to release said clutch, and

means responsive to a first input signal from said third switch means for blocking the second input signal to prevent release of the clutch.

4,113,080

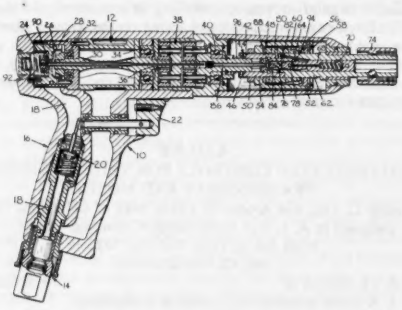
TORQUE WRENCH AIR SHUT-OFF

Clyde David Thackston, and Robert H. Alexander, both of Columbia, S.C., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 686,085, May 13, 1976, abandoned. This application Jun. 29, 1977, Ser. No. 811,423

Int. Cl.² F16D *43/20*

U.S. Cl. 192—150 **7 Claims**



1. In a power operated tool for setting fasteners and the like to a predetermined torque, said tool having a motor connected

to rotate a drive shaft, said drive shaft being connected to the tool output through a torque-responsive coupling, said tool having a normally-closed valve in the line for supply of power to said motor, and said normally-closed valve being initially opened by engagement of said tool with a workpiece, the improvement comprising a shut-off means responsive to relative rotation between said drive shaft and said tool output to allow said valve to close, in which initial relative rotation between said drive shaft and said tool output arms said shut-off means to sense a predetermined magnitude of relative rotation and in which further relative rotation triggers said shut-off means to actuate said valve to interrupt the supply of power to said motor.

4,113,081

MECHANISM FOR ACTUATING A MEMBER OF A TYPEWRITER

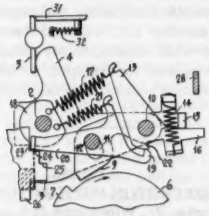
Ulrich Menzi, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

Filed Jun. 16, 1976, Ser. No. 696,864

Claims priority, application Switzerland, Jun. 24, 1975, 8170/75

Int. Cl.² B41J *19/54*

U.S. Cl. 400—333 **4 Claims**



1. In a typewriter, a mechanism for actuating a member from a continuously rotatable drive shaft, comprising a principal lever cooperating with said member and carrying a catch able to occupy an active position in the trajectory of a peripheral projection of the shaft and a rest position out of said trajectory, a control lever for said catch, wherein the principal lever additionally carries a locking lever cooperating with said control lever of the catch, said catch being connected to the control lever by a spring biasing said catch and said control lever relative to one another into an angular position defined by abutment means, and a fixed stop is disposed in the path of the control lever during movement of the principal lever in response to engagement of the catch by said projection to return the control lever to a position for locking the catch while the catch is still in engagement with said projection.

4,113,082

APPARATUS AND METHOD FOR STORING AND TRANSPORTING SUBSTRATES IN A BATCH-TYPE VACUUM PROCESS

Mitchell E. Timin, Berkeley, Calif., assignor to Airco, Inc., Montvale, N.J.

Filed May 17, 1976, Ser. No. 686,778

Int. Cl.² B23Q *7/03*

U.S. Cl. 198—339 **5 Claims**

1. Apparatus for storing and transporting substrates inside an evacuable chamber containing vacuum coating equipment, comprising:

(a) means for receiving and supporting a multiplicity of substrates in a first stack adjacent to the coating equipment;

(b) means for receiving and supporting a multiplicity of substrates in a second stack adjacent to the coating equipment;

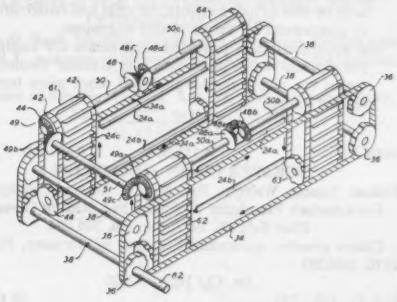
(c) means for conveying a substrate from the top of the first stack to the top of the second stack;

(d) means for moving the substrates in the second stack toward the bottom;

(e) means for conveying substrates from the bottom of the second stack to the bottom of the first stack;

(f) means for moving the substrates in the first stack toward the top; and

(g) energy storage means for overcoming inertia in the first



stack moving means and the second stack moving means, said storage means including a first shaft for driving the stack moving means, a second shaft for driving the first shaft, a detent cam fixed to the second shaft, a cam follower for alternately restraining and releasing the detent cam, and a torsion spring connected between the first shaft and the second shaft for storing energy as the first shaft rotates when the detent cam is restrained by the cam follower, and transmitting energy to rotate the second shaft when the detent cam is released.

4,113,083

APPARATUS FOR TRANSFERRING A DEFORMABLE CYLINDRICAL WORK PIECE FROM ONE WORK STATION TO ANOTHER

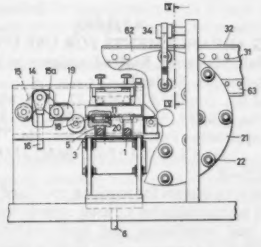
Axel Friese, Wuppertal, Fed. Rep. of Germany, and Stefan Simon, Moedling, Austria, assignors to Dr. Carl Hahn G.m.b.H., Dusseldorf, Fed. Rep. of Germany

Filed Oct. 13, 1976, Ser. No. 731,954

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1975, 2546245

Int. Cl.² B65G *29/00*

U.S. Cl. 198—480 **10 Claims**



1. An apparatus for receiving a deformable cylindrical work piece from a first station by axial displacement of said piece and for axially displacing said piece into a second station, comprising:

a transfer element extending substantially in one main plane and movable in said plane, said transfer element having a

plurality of openings therethrough said openings having an inner perimeter;

bushes for receiving said work piece, said bushes mounted within said openings for movement with said transfer element and with their axes transverse to said main plane;

means for moving each of said bushes into approximate axial alignment with said first station for receiving a work piece, and for moving said bushes into an approximate axial alignment with said second station for discharging said work piece; and

said bushes being floatingly mounted within said openings so as to be able to move in both the axial and radial direction to compensate for errors in said alignment;

said apparatus being provided with means for axially displacing said work piece into said transfer element and means for axially discharging said work piece into said second station.

4,113,084

SCRAPER CHAIN ASSEMBLIES

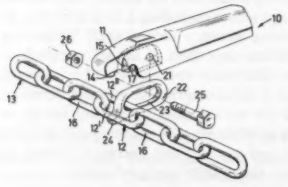
Helmut Temme, Waltrop, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Feb. 16, 1977, Ser. No. 769,094

Claims priority, application Fed. Rep. of Germany, Feb. 28, 1976, 2608289

Int. Cl.[2] B65G *19/00*

U.S. Cl. 198—731 **28 Claims**



1. In or for a scraper-chain assembly for a mine conveyor; a scraper unit comprising: a scraper with end portions shaped at their undersides to seat onto horizontal chain links of a pair of chains and provided with shaped internal pockets narrower than said end portions; locking elements for securing the scraper to said chain links; and means securing the scraper to said locking elements wherein said locking elements extend around the inner shanks of said links and are received and supported within said pockets and the pockets overlap the inner shanks of the chain links and have internal walls which engage with the locking elements to restrict lateral movement in both directions across the chain links and vertical movement above the chain links.

4,113,085

SEALING ARRANGEMENTS FOR USE UNDER WATER

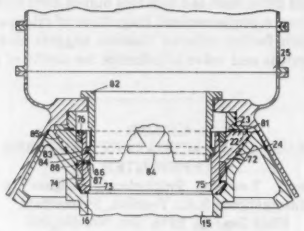
Kenneth Ball, Hightown, England, assignor to Vickers-Intertek Limited, London, England

Division of Ser. No. 685,676, May 12, 1976, which is a division of Ser. No. 456,769, Apr. 1, 1974, Pat. No. 3,968,656. This application Feb. 23, 1977, Ser. No. 771,356

Int. Cl.[2] F16J *13/02*; B63C *11/34*

U.S. Cl. 277—9 **4 Claims**

1. In and for a system for working on a fixed sub sea installation which system includes a transit capsule and a hollow body enclosing said installation, said body including an opening through which the interior of the body is normally exposed to the pressure of the surrounding water and wherein said transit capsule is sealingly engageable with said body around said opening so that the interior of said capsule and of said body can be subsequently connected together through said opening to form a sub sea capsule in which men can work on said installation at substantially atmospheric pressure, the invention comprising a sealing arrangement between said transit capsule and said body, comprising oppositely directed faces on said transit capsule and said body co-axially surrounding said opening, a member disposed between the capsule and said body and having faces complementary with the faces on said transit capsule and said body, said member being normally engaged with said body even in the absence of said transit capsule, a first seal disposed between the complementary faces on said member



and on said body and a second seal disposed between the complementary faces on said member and on said transit capsule, and cooperating means carried by said member and said capsule and operable from within said capsule to break the seal between said member and body and disengage said member from said body while simultaneously connecting said member to said transit capsule for transport of said member by said capsule to a position remote from said body.

4,113,086

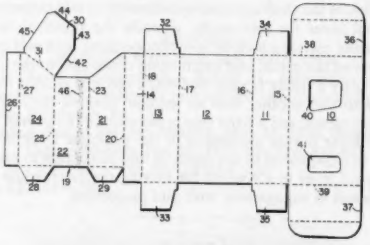
END LOADED CARTON WITH AUTOMATIC HEADER

Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.

Filed Oct. 14, 1977, Ser. No. 842,261

Int. Cl.[2] B65D *5/48, 5/50*

U.S. Cl. 206—45.14 **9 Claims**

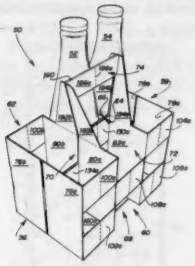


1. An end loaded carton of generally parallelopiped configuration, formed from a single blank of paperboard or the like comprising, spaced outer front and rear walls separated from one another by a pair of outer side walls, end closure flaps for each end of the carton, and an inner product receiving compartment, said inner compartment comprising a pair of inner side wall panels spaced apart and inboard of said outer side walls and adhered to the said outer front and rear walls, the improvement comprising a first inner compartment header panel foldably attached to an end of one of said inner side wall panels along a diagonally oriented score line and adapted for automatic orientation over the end of said inner compartment when said carton is squared for loading, by the initial abutment of a lower edge of said header panel against the inside of said rear wall, said abutment causing the concomitant rotation of said header panel about its diagonal fold line.

4,113,087
PLASTIC COLLAPSIBLE ARTICLE CARRIER

Paul J. Morcom, Rte. 1, Box 235, Henderson, Tex. 75652

Filed Mar. 17, 1976, Ser. No. 667,679
Int. Cl.[2] B65D *85/30*
U.S. Cl. 206—174 18 Claims



1. An injection molded plastic collapsible article carrier having open and collapsed positions and formed from two half sections which are hinged together, wherein each half section comprises:

first and second end walls parallel to one another when the carrier is in the open position;

first and second side walls parallel to one another and hingedly joined to edges of said first and second end walls to extend perpendicularly to said first and second end walls when the carrier is in the open position, portions of said side walls having heights less than the height of said end walls and portions of said first side wall being vertically spaced from portions of said second side wall, such that said portions of said first side wall are vertically offset from said portions of said second side wall to enable molding thereof in opposed dies;

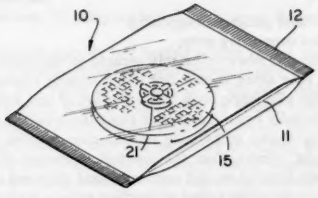
first and second dividing walls, parallel to one another and parallel to said end walls, being hingedly joined at spaced locations between said first and second side walls to form a plurality of receiving cellular compartments between said first and second side walls within the collapsible article carrier; and

a bottom member hingedly joined to edges of at least one of said walls, wherein the collapsible article carrier may be folded about said hinged attachments to a flat collapsed position and folded to the open position to form a plurality of open ended cellular compartments for receiving articles.

4,113,088
STERILE PACKAGE

Richard D. Binkhorst, 125 E. 74th St., New York, N.Y. 10021

Filed Jun. 6, 1977, Ser. No. 803,959
Int. Cl.[2] B65D *81/18*; A61F *1/16, 1/24*
U.S. Cl. 206—210 7 Claims

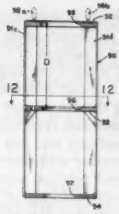


1. A sterile package including an intraocular lens implant comprising a case having a pair of separable cover parts in closed position thereby enclosing a space therebetween, means in one said cover part forming a seat removably receiving said intraocular lens implant, said other cover part cooperating with said one cover part in said closed position to retain said intraocular lens implant in said seat forming means, means in a said cover part defining an aperture through said cover part aligned with said lens, and sealed package means of thin, optically transparent material enclosing said case.

4,113,089
SUPPORT FIXTURES FOR PREASSEMBLED UNIT OR CARTRIDGE FOR MULTI-STAGE BARREL TYPE CENTRIFUGAL PUMPS

Austin R. Bush, Madison, and Frank L. Ferrarese, Nutley, both of N.J., assignors to Worthington Pump, Inc., Mountainside, N.J.

Division of Ser. No. 716,664, Aug. 23, 1976. This application Mar. 2, 1977, Ser. No. 773,778
Int. Cl.[2] B65D *85/68*
U.S. Cl. 206—319 2 Claims



1. A fixture for preassembling the working parts of a pumping unit to be mounted in engagement with spaced shoulders formed a predetermined spaced distance from each other in the outer casing of a multi-stage barrel type centrifugal pump includes,

a. a plurality of longitudinally extending side legs disposed in spaced relation to each other,

b. an upper transverse member connected to the upper end of said plurality of longitudinally extending side legs having, a sized access opening therethrough to permit the working parts of the pumping unit to be assembled to be passed into and out of said fixture,

c. at least one other transverse member connected to said plurality of longitudinally extending side legs a spaced distance from said upper transverse member having, a sized assembly opening therethrough for holding the working parts of the pumping unit to be assembled,

d. a first shoulder means formed on said upper transverse member about the sized access opening formed therethrough disposed for engagement with at least one of the working parts of the pumping unit to be assembled in the fixture.

e. a second shoulder member formed in said other transverse member about the sized assembly opening formed therethrough for abutting engagement with at least one other working part of the pumping unit to be assembled in the fixture,

f. said first should means and second shoulder means a predetermined spaced distance from each other equivalent to the predetermined spaced distance of the shoulders in said outer casing of the multi-stage barrel type centrifugal pump in which the preassembled working parts of the pumping unit will be mounted,

g. threaded bores in said upper transverse member, and

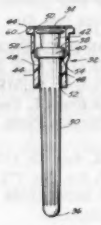
h. threaded means in the threaded bores in said upper transverse member to engage said at least one of said working parts to exert axial forces on said working parts of the pumping unit to place the same under compression stresses after the same have been assembled.

4,113,090

MEDICAL INSTRUMENT PACKAGE

Dennis L. Carstens, Columbus, Nebr., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Aug. 15, 1977, Ser. No. 824,412
Int. Cl.[2] B65D *85/24*
U.S. Cl. 206—365 6 Claims



1. A package for a medical instrument comprising; a hollow shield having an open end surrounded by a flange for insertion and removal of at least a portion of a medical instrument and means to support and protect the instrument when it is contained therein, a separate cap adapted to be mounted on the shield with an opening therein aligned with the opening in the shield to permit insertion and removal of the instrument with respect to the shield and cap, said cap being shiftable between a first position to cooperate with the shield in protecting the instrument and a second position exposing and positioning a portion of the instrument exteriorly of the package to facilitate grasping and removal thereof, wherein the cap is open at both ends, and has a shoulder on its inner surface intermediate the ends of the cap, the shield adapted to be extended through the opening in one end of the cap and to remain engaged with inner surfaces on the cap, the cap being in a first position and restricted from further movement in an upward direction by the underlying engagement of the lateral shoulder on the inner surface of the cap and the undersurface of the flange on the shield, the cap surrounding the portion of the hub extending from the shield when the cap is in the first portion, the cap being slidably shiftable to a second position with the shoulder on the cap being moved away from the flange on the shield and the cap in the second position exposing a portion of the hub extending from the shield to facilitate grasping of the hub and removal of the medical instrument from the shield, and removable closure means covering the opening in the cap and shield and, when removed, exposing the opening in the cap and shield to permit insertion of removal of a medical instrument.

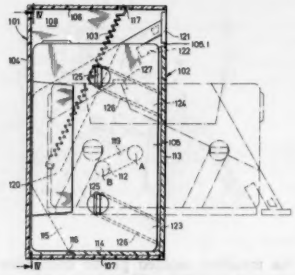
4,113,091

HOLDERS FOR TAPE CASSETTES

Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Lenzerheide, Switzerland

Filed Jun. 4, 1975, Ser. No. 583,756
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1974, 2427103
Int. Cl.[2] B65D *43/16*
U.S. Cl. 206—387 11 Claims

1. A holder for tape cassettes and the like comprising a housing for receiving the cassette and having broad and spaced sidewalls to receive a cassette therebetween and having narrow end and base walls between the sidewalls and also having a narrow slot-shaped entrance opposite one of said narrow walls whereby to receive and carry the cassette with the reel axes extending transversely through the broad sidewalls, manipulating means on the housing for engaging the cassette when introduced into the housing, said manipulating means including a cassette-engaging portion swingable relative to said narrow walls and about at least one axis extending transversely through the planes of the sidewalls to swing with the cassette as the cassette swings inwardly and outwardly of the entrance, said manipulating means including a spring urging said cassette-engaging portion generally toward the entrance for thrusting the cassette outwardly through the entrance, and said manipulating means also including locking means connected with the housing and opposing the thrust of the spring to cooperate with the cassette-engaging portion in retaining the cassette in the housing, and the manipulating means including



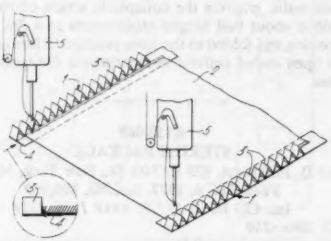
a pair of elongated flexible arms and a cam mounted on each of the arms and facing inwardly of the housing adjacent the entrance to confront, engage and obstruct the cassette as the cassette emerges partly through the entrance under the initial thrust provided by the spring and also retaining the cassette against falling out by tipping about axes lying parallel to the sidewalls of the housing.

4,113,092

PACKAGING

Raymond Williams, Warrington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation-in-part of Ser. No. 624,242, Oct. 20, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,948
Claims priority, application United Kingdom, Oct. 30, 1974, 47013/74; Jan. 17, 1975, 2812/75; Jun. 18, 1975, 26017/75
Int. Cl.[2] B65D *85/66*
U.S. Cl. 206—408 13 Claims



1. A coiled package comprising:
a coiled supporting strip;
a coiled pile fabric releasably secured to the coiled supporting strip along at least one longitudinally extending edge of the pile fabric such that a portion of said strip extends outwardly beyond said edge along the length of said edge;
spacing means comprising an elongate member having a height greater than the nominal thickness of said pile fabric secured to said portion of said strip and separating the turns of the coiled supporting strip, a surface of each turn of said elongate spacing member being adjacent a surface of each turn of said portion of said strip; and
a bonding agent between said surface of each turn of the elongate spacing member and the adjacent surface of each

turn of said strip, said bonding agent being applied prior to coiling and bonding said surfaces together to form a unified spacer strip structure whereby the turns of the coil of fabric are separated and maintained apart by said spacer means.

4,113,093

PACKAGE CONVERTIBLE INTO A DISPLAY MEANS FOR CUT FLOWERS

Yves Hendrickx, Rte. d', Orleans, France (F-45000)

Filed Feb. 4, 1977, Ser. No. 765,545

Claims priority, application Belgium, Feb. 9, 1976, 164178; Jan. 19, 1977, 174217

Int. Cl.² B65D *85/52*

U.S. Cl. 206—423 **9 Claims**

1. A package convertible into a display means for selectively transporting, storing and displaying cut flowers having stems, which comprises

(a) a topless box-shaped casing cardboard having providing the free circulation of air and a plurality of side walls of a height sufficient for accommodating the cut flowers disposed in a vertical position,

(b) a cup of a water-impervious material at a lower portion of the casing and permanently connected therewith to form a part of the casing, for containing water, (c) score lines on the side walls of the casing defining a plane above the cup for cutting the side walls along said lines when the package is converted into the display means,

(d) a support for the cut flowers extending above the cup and defining at least one opening for receiving the stems of the flowers when the side walls are cut and the package has been coverted into the display means, and

(e) the upper edges of the side walls being inwardly folded to form a support frame around the edges only, thereby permitting the stacking of several packages.

4,113,094

CONTAINER FOR CUT FLOWERS

Herbert S. Collin, 35 Stillings St., Boston, Mass. 02210

Division of Ser. No. 700,342, Jun. 28, 1976, abandoned. This application Apr. 18, 1977, Ser. No. 788,333

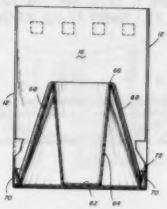
Int. Cl.² B65D *85/50*

U.S. Cl. 206—423 **3 Claims**

1. A container for shipping and displaying cut flowers comprising:

a generally rectangular box having a front wall, a rear wall, a pair of sidewalls and top and bottom walls;

an insert, receivable in the bottom of the box, said insert being molded from a single piece of plastic, said insert including a central flower-receiving bucket portion including a bottom wall and upwardly diverging sidewall, said sidewall terminating at its upper end in a open mouth; a skirt extending from the upper end of the sidewall downwardly and outwardly about the central flower-receiving portion to define a generally pyramid-shaped support, the lower end of the skirt being of rectangular configuration and being disposed at the level of the bottom wall of the central bucket portion to enable the bucket and lower ends of the skirt to rest on the bottom wall of the box, the peripheral configuration of the lower end of the skirt corresponding to that of the bottom of the box; a flange extending about the lower end of the skirt, the flange extending upwardly and outwardly therefrom to define a trough about the lower end of the skirt; the peripheral configuration and dimensions of the upper edge of the



flange corresponding to that defined by the sidewalls of the box, the upper edge of the flange being in engagement with the inner surfaces of the sidewalls of the box and the corners defined at the juncture of the sidewalls of the box; and

means forming a plurality of heightwise extending ribs on the skirt.

4,113,095

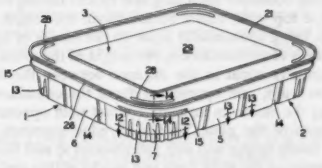
TRAY-TYPE PROCESSED FOOD CONTAINERS

Raymond A. F. Dietz; Danny L. Fundom, both of Massillon; George J. Henning, Canton, and Lynn B. McKinney, Massillon, all of Ohio, assignors to Van Dorn Company, Cleveland, Ohio

Filed Nov. 26, 1976, Ser. No. 744,965

Int. Cl.² B65D *21/02, 7/48, 7/46*

U.S. Cl. 206—508 **6 Claims**



1. One-piece tray construction for processed food containers including light gauge sheet metal, bottom, side and end walls forming a generally rectangular tray; the tray having an outer surface and an inner surface provided with a protective coating; the side and end walls being connected by curved corner walls; an outturned continuous ledge formed at the upper ends of the side, end and curved corner walls; said side, end and curved corner walls tapering upward outward between the bottom wall and ledge; second side, end and curved corner walls offset laterally outward of the first mentioned side, end and curved corner walls extending upward from the perimeter of the ledge and forming the upper open end of the tray; said second walls having an outturned continuous terminal beadforming flange at the open end of the tray; each second curved corner wall having a smaller radius of curvature than that of any of the first mentioned curved corner walls to provide widened ledge portions at end corner of the tray; horizontally oriented corrugation means embossed outwardly in each of said second curved corner walls; and said corner corrugation means being adapted to engage and be supported on the outturned terminal beadforming flange of a tray next below when a series of trays are stacked in nested condition, with the outer

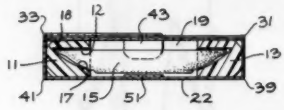
surfaces of the first mentioned side, end and curved corner walls of adjacent trays in the nested stack being spaced from the inner protective coated surfaces of the trays next below.

4,113,096

PACKING BOX FOR CHINA

Donald M. Scott, La Habra, Calif., assignor to Fibre Containers Company, City of Industry, Calif.

Filed Nov. 1, 1976, Ser. No. 737,600
Int. Cl.² B65D *81/02, 85/30*
U.S. Cl. 206—523 **1 Claim**



1. A packing box for a circular dish or plate having a circular edge in a single plane and having an annular portion sloping upwardly to said circular edge, including in combination:

a pair of separate cushioning blocks of plastic foam material each having a length, a width and a height, and having upper and lower surfaces;

each of said blocks having an indentation in one side intermediate said upper and lower surfaces thereof and complementary to and receiving an edge segment of the plate, said indentation in each block being arcuate when viewed from above said upper surface of said block and having substantially the same radius as the plate, said indentation in each block having a flat upper wall in the shape of a segment of a circle, when viewed in cross section, conforming to the plane of the circular edge of the plate, and said indentation in each block having a lower wall of generally conical shape which, when viewed in cross section, slopes upwardly to and converges with the circular edge of said flat upper wall and which is complementary to said annular portion of the plate; and

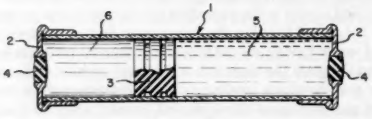
a confining container enclosing said blocks having four side walls, a top wall, and a bottom wall, the length of the blocks being substantially equal to the length of opposite side walls of the containers, the height of the blocks being substantially equal to the distance between the top and bottom walls, said opposite walls of the container maintaining the blocks in intimate contact with opposed edge segments of the plate, with such edge segments of the plate firmly fitting into said indentations in said blocks, so as to suspend the plate from said blocks within and spaced from all the confining walls of said container.

4,113,097

AMPULE CAPABLE OF BEING AUTOCLAVED

James J. Finn, Upper Saddle River, N.J., assignor to Diagnostic Isotopes Incorporated, Upper Saddle River, N.J.

Filed Aug. 9, 1976, Ser. No. 712,802
Int. Cl.² A61J *1/06;* B65D *85/54*
U.S. Cl. 206—528 **4 Claims**



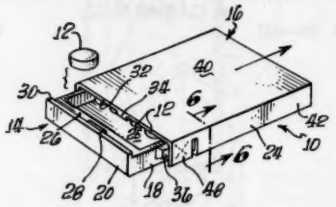
1. An ampule which comprises, in combination, a tubular body of uniform diameter having end members each containing a rubber seal, a plunger of unitary construction being impervious to fluids and disposed moveably within the tubular body, said plunger defining a first compartment containing a dosage solution and a second compartment containing a gas within an expansion space, whereby upon autoclaving the ampule said plunger moves toward the expansion space to accommodate the expansion of the dosage solution.

4,113,098

PILL-DISPENSING AND STORAGE CONTAINER

Charles S. Howard, 1500 W. 13th St., Upland, Calif. 91786

Filed May 25, 1977, Ser. No. 800,351
Int. Cl.² B65D *43/20, 85/56*
U.S. Cl. 206—540 **5 Claims**



1. A dispensing-and-storage container for pills and like medication comprising:

a box-like receptacle having a forward wall member, a rear wall member, oppositely disposed side wall members, and a substantially flat bottom member defining a storage compartment to receive pills therein;

a cover slidably mounted to said receptacle, said cover having a top member and depending side members and open forward and rear ends, said cover being flexible;

releasable locking means comprising a lock recess defined in the forward wall member of the receptacle, and a locking lug depending from and adjacent to the forward edge of the cover, said lug being positioned to engage in said lock recess when the cover is in closed position;

said cover being adapted for upward bowing deformation to disengage the locking lug from the lock recess upon application of inward pressure on forward portions of the cover side members;

interengaging slide means on said side members of said cover and said side wall members of said receptacle; and

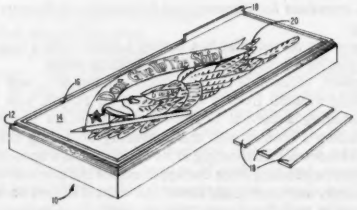
stop means intermediate the ends of said top member of said cover and depending therefrom for engagement with said rear wall member of said receptacle to limit the relative sliding movement therebetween.

4,113,099

WOOD CARVING KIT

Arthur Beckerman, 45 Hutchins St., Auburn, Me. 04210

Filed Oct. 3, 1977, Ser. No. 838,533
Int. Cl.² B65D *69/00*
U.S. Cl. 206—575 **8 Claims**



1. A wood carving kit comprising:

a unitary block of wood having a carving surface;

a frame portion around the periphery of the block and integral with the block;

a groove around the periphery of the carving surface and extending inward from that surface to a predetermined depth in the block defining the maximum carving depth of a pattern to be carved into the carving surface, the groove separating the carving surface from the frame portion;

a pattern provided in predetermined placement on the carving surface and depicting an item to be carved in accordance with that pattern; and

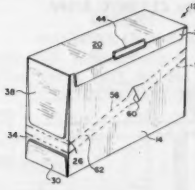
at least one guard element sized and configured to be removably disposed in the groove and when fully inserted therein to extend above the carving surface by a predetermined amount, and operative to shield the frame portion from possible damage by a carving tool being used in portions of the carving surface adjacent the guard element.

4,113,100

DISPLAY CARTON

Lawrence M. Soja; Daniel F. Stokes, both of Chicago, and Richard W. Beile, Park Ridge, all of Ill., assignors to Stone Container Corporation, Chicago, Ill.

Filed Jan. 27, 1977, Ser. No. 762,874
Int. Cl.² B65D 5/54
U.S. Cl. 206—602 **1 Claim**



1. A folded display carton forming blank comprising two cartons end panels and two carton face panels, said panels each having opposed side edges and opposed end edges, one of said face panels being positioned between the two end panels with the opposed side edges of the one face panel being respectively integrally hinged to one side edge of each of the two end panels, the second of said face panels being integrally hinged to the second side edge of one of said end panels, the opposed end edges of the panels being generally aligned in two parallel rows along opposed longitudinal edges of the blank, each of said panels having a side flap integrally hinged to each of the opposed end edges thereof, the improvement comprising:

a. a tear strip formed diagonally across each of said face panels between the opposed longitudinal edges of the blank, each tear strips, at the opposed ends thereof, including continuations extending across the associated side flaps generally perpendicular to the longitudinal edges of the blank, said tear strips being mirror images of each other;

b. the side flap of a first end panel being longer than the side flap of the second end panel along a first longitudinal edge of the blank, the side flap of the second end panel being longer than the side flap of the first end panel along the second longitudinal edge of the blank;

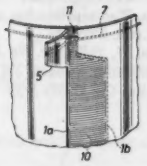
c. the combined lengths of the end panel side flaps on each longitudinal edge of the blank, perpendicular to the longitudinal edge, being less than the face panel width between the opposed side edges thereof to define a gap between the side flaps on each longitudinal edge of the blank in the folded carton alignable with the tear strip continuations in the side flaps of the face panels on the same longitudinal edge of the blank.

4,113,101

OPENING ARRANGEMENT FOR PACKING CONTAINERS

Herwig Pupp, and Otto Birger Andersson, both of Lund, assignors to AB Ziristor, Lund

Continuation-in-part of Ser. No. 720,516, Sep. 3, 1976. This application Mar. 15, 1977, Ser. No. 777,940
Int. Cl.² B65D 17/02
U.S. Cl. 206—606 **4 Claims**



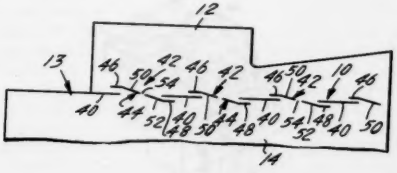
1. A packing container provided with an opening arrangement comprising a substantially cylindrical body member formed from a convoluted blank with overlapping sealed end portions, said body member being closed at the top and bottom thereof and comprised of a carton forming material having a base layer and at least one layer of thermoplastic material disposed on the inside of the body member, a tear thread disposed circumferentially on said thermoplastic layer on the inside of the body member adjacent to and spaced from the top thereof, the outer of said overlapped sealed end portions being provided, at the top thereof, with a circumferentially extending tab member having the tear thread passing circumferentially therealong, and the inner of said overlapped sealed end portions having a cut-out portion at the top thereof corresponding in size and shape with the tab member, the circumferential dimension of the cut-out portion being about ¾ to 4/5 of the width of the overlapping seal below said cut-out portion to provide an upper, vertically extending, narrow finger-like seal between the outer of said end portions adjacent said tab member and the inner of said end portions adjacent the cut-out portion, whereby opening the packing container may be facilitated by pulling the tab member and associated tear thread to tear through the narrow finger-like seal and cylindrical body members.

4,113,102

SCORE LINE CONFIGURATION FOR ICE CREAM CARTONS AND THE LIKE

David Charles Mueller, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Oct. 11, 1977, Ser. No. 840,739
Int. Cl.² B65D 5/54, 17/24
U.S. Cl. 206—611 **8 Claims**



1. A score line configuration comprising:

a plurality of intermittent aligned cut scores which are spaced along and aligned in the principal tear direction of said configuration;

a plurality of slanted Z configured cut scores in the spaces between said aligned cut scores, each having a diagonal

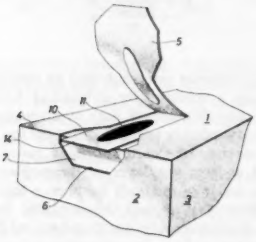
cut score extending from one end of a said aligned cut score to the adjacent end of the next aligned cut score, and a pair of cut score end extensions attached to the ends of said diagonal cut scores, said extensions being parallel to, juxtaposed with, and spaced apart from said aligned cut scores.

4,113,103

OPENING ARRANGEMENT FOR PACKING CONTAINERS

Lars Christer Carlsson, Blentarp, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Jun. 21, 1977, Ser. No. 808,690
Claims priority, application Sweden, Jul. 8, 1976, 7607803
Int. Cl.[2] B65D 5/54
U.S. Cl. 206—611 **7 Claims**



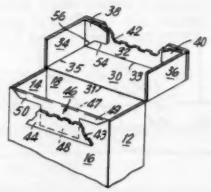
1. In a packing container having a first wall and a second wall intersecting along an edge, an opening arrangement comprising a plurality of layers of sheet material, the outer layer having a weakening line extending across said first wall and over said edge and along said second wall in the shape of a lug hinged on said first wall, a cover layer on the interior of the container, and a flexible, resilient, normally flat strip interposed between said outer layer and said cover layer, said strip having a pouring opening therein positioned in said first wall and underlying said lug, said strip projecting over said edge, and seal means between said layers for preventing the discharge of the contents of said container except through said pouring opening when said lug is torn away from said walls along said weakening line.

4,113,104

TAMPERPROOF RECLOSABLE CARTON

George Leroy Meyers, Menasha, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Jun. 9, 1977, Ser. No. 805,096
Int. Cl.[2] B65D 17/16
U.S. Cl. 206—626 **32 Claims**



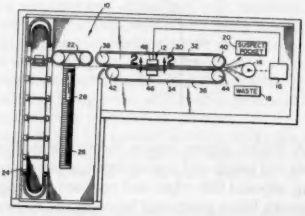
1. In a reclosable paperboard carton formed of a single cut and scored blank having a receptacle portion and a cover portion which telescopes over the upper edges of the receptacle portion and wherein the receptacle portion comprises hingedly connected front, rear, end and bottom panels, the cover portion comprises a top cover panel hingedly connected to the upper edge of the rear panel, end cover panels and a front cover panel all hingedly connected to the top cover panel and forming skirt portions parallel and adjacent to the respective underlying panels, a bridging panel hingedly connected along a line of weakness to the upper edge of the receptacle panel and folded outwardly to lie sandwiched between the front cover panel and the front receptacle panel and adhesively secured to the front cover panel, the improvement wherein said front cover panel comprises at least one central tab portion, defined by severable lines of weakness and adhesively secured to said bridging panel whereby severance of said central tab from said front cover panel is effected upon opening the carton.

4,113,105

DEVICE FOR CHECKING ENVELOPES FOR ENCLOSED DOCUMENTS

John R. DeHart, Coral Gables, Fla.; Larry L. Nelson, Redwood City, Calif., and William H. Krehl, Homestead, Fla., assignors to Docutronix, Inc., Homestead, Fla.

Filed Mar. 7, 1977, Ser. No. 775,386
Int. Cl.[2] B07C 5/344
U.S. Cl. 209—549 **12 Claims**



1. In a device for checking a plurality of generally rectangular envelopes for enclosed documents, the combination comprising: means for feeding said envelopes one at a time past an inspection station at a substantially constant velocity with each of said envelopes being oriented so that two of its edges are leading and trailing edges, respectively, both perpendicular to its direction of movement and its remaining two edges are parallel to said direction of movement, and a detection means at said inspection station, said detection means comprising first, second and third opacity sensors spaced from one another along a line generally parallel to the plane of said envelopes and perpendicular to said direction of envelope movement and each producing an electrical output signal which varies with the opacity of an associated discrete sensed field, said three opacity sensors being arranged so that as said envelopes are moved past said inspection station the field sensed by said first sensor is located inboard of one of said two remaining edges of each envelope, said field sensed by said second sensor is located inboard of the other of said remaining edges of each envelope, and said field sensed by said third sensor is located between said fields of said first and second sensors, and suspect signal producing means responsive to the existence for a predetermined time of a substantial difference in the values of the output signals of said first and third opacity sensors or of the output signals of said second and third opacity sensors for producing a suspect signal indicating the suspected presence of a document in the envelope producing such suspect signal.

4,113,106
PROCESS OF TIN FLOTATION

Shiro Obinata, Tokyo; Shigeru Hashimoto, Yokohama, and Takeshi Sahara, Funabashi, all of Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1975, Ser. No. 613,928
Claims priority, application Japan, Jun. 4, 1975, 50-66374
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—167 10 Claims

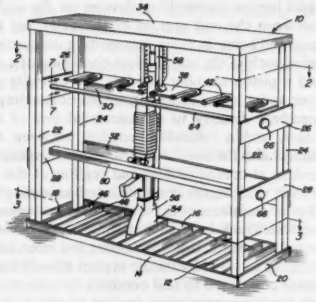
1. A process for the flotation of tin from a tin concentrate containing cassiterite and siderite to float cassiterite as a froth, wherein said tin concentrate is formed by removing in a froth sulfide minerals contained in a tin ore, removing fine slimes from the resulting flotation tailing and subjecting the substantially fine slime-free product to conventional tin flotation, characterized by

subjecting said tin concentrate containing cassiterite and siderite to flotation with a frother consisting essentially of pine oil or cresol in the presence of an inhibitor for siderite consisting essentially of at least one of sulfurous acid and a sulfite.

4,113,107
MACHINE GUN RACK

Dennis A. Jaeger, R.R. 1, Strandburg, S. Dak. 57265

Filed Nov. 2, 1977, Ser. No. 848,012
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—4 10 Claims

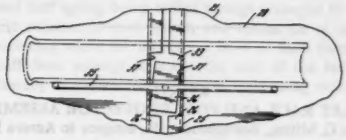


8. In combination with a gun rack including guide defining opposite side portions and adapted to support a row of upstanding long guns therein between said side portions with the trigger guards of said guns aligned in a path extending between said side portions in predetermined position relative to said rack, an elongated rigid support and lock member longitudinally and slidingly received through one of said side portions, said trigger guards and interlockingly engaged with the other of said side portions, an elongated rigid shield member defining a laterally outwardly opening cavity extending longitudinally thereof, said shield member being snugly lengthwise received between said side portions, a plurality of aligned guides spaced along and secured in said cavity, said shield member being positioned with said guides disposed along said path, said trigger guards received in said cavity between pairs of adjacent sleeves and said support and lock member being also received through said trigger guards with said support and lock member embraced by said shield member.

4,113,108
ADJUSTABLE BOOK HOLDING DEVICE

Lloyd R. Anderson, Fennville, Mich., assignor to C-Line Products, Inc., Des Plaines, Ill.

Division of Ser. No. 675,057, Apr. 8, 1976, abandoned. This application Jul. 27, 1977, Ser. No. 819,332
Int. Cl.[2] A47B *65/00*
U.S. Cl. 211—43 4 Claims



1. An adjustable book holding device comprising, in combination:

(a) a support panel having a longitudinally extending guideway recessed therein;

(b) said guideway having an upper wall and a lower wall spaced therefrom and opposed side walls connected therebetween;

(c) a pair of opposed guideway flanges disposed in laterally spaced relation with each other and defining the upper wall of said guideway;

(d) at least one pair of upstanding book supports slidably mounted in said guideway and having a generally planar book engaging portion to abut against one or more books standing upright on said panel;

(e) each said book support having a depending shank adapted to slide freely between said opposed guideway flanges;

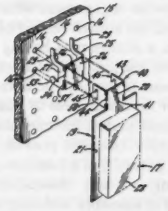
(f) a support base of generally rectangular form slidable generally along its longitudinal axis in said guideway and having a lateral dimension substantially less than that between the opposed side walls of said guideway; and

(g) said support base being fixed to said shank with its longitudinal axis skewed relative to the general plane of said book support, whereby diagonally opposed corner portions of said support base are driven into frictional locking engagement with said guideway side walls in response to lateral pressure from said books.

4,113,109
MERCHANDISING SYSTEM FOR USE WITH PERFORATED PANELS OR THE LIKE

Joseph W. Donnelli, and Richard D. Barnes, both of Rockford, Ill., assignors to Southern Imperial, Inc., Tupelo, Miss.

Filed Aug. 4, 1977, Ser. No. 821,809
Int. Cl.[2] A47F *7/00*; A47G *29/00*
U.S. Cl. 211—49 R 16 Claims



1. A display package having a card for holding merchandise, said package having first means for hanging the package from and in front of an upright member and having second means enabling an identical display package to be hung from and in front of the first package at the same elevation as the first

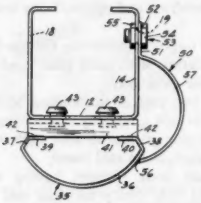
package, said first means comprising a pair of downwardly extending and laterally spaced hooks, hinges connecting said hooks to said card to swing rearwardly from a first position in which each hook is disposed in the same plane as said card to a second position in which each hook extends rearwardly from said card, and said second means comprising upwardly opening notches formed in said card at the upper ends of said hinges.

4,113,110

PALLET RACK AND POST PROTECTOR ASSEMBLY

Douglas C. Mittag, Bolingbrook, Ill., assignor to Aurora Equipment Company, Aurora, Ill.

Filed Mar. 28, 1977, Ser. No. 782,185
Int. Cl.[2] A47B 45/00; A47F 5/00; A47B 95/00
U.S. Cl. 211—191 **13 Claims**



1. In combination, a storage rack having a post with spaced keyhole slots on one margin and a second margin disposed at right angles to the first margin with said second margin having spaced holes,

a post protector including an arcuate intermediate section and opposed attachment sections at its opposite ends which attachment sections are disposed behind the intermediate section,

means joining attachment studs to said attachment sections and with said studs extended rearwardly in a direction away from said intermediate arcuate section and being engageable in said keyhole slots securing the post protector in assembly with the storage rack, and

a corner post protector having an attachment leg and fasteners securing said attachment leg with the holes in said second margin of said post and with said corner post protector having an arcuate section having a radius extending at right angles to a radius of said arcuate section of said post protector and with the arcuate section of said corner post protector having its outermost edge disposed for sliding edgewise engagement with respect to an outer curved surface of the arcuate section of the post protector.

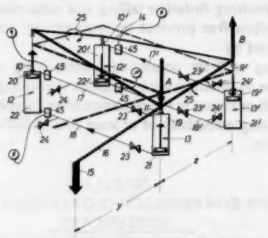
9. In combination, a storage rack having a post with spaced keyhole slots on one margin, and at least one beam having studs securing the beam in the keyhole slots on the post, a sheet metal post protector for attachment to said post and comprising a generally channel-shaped intermediate section having its opposite ends inwardly extended providing opposed attachment sections lying generally in a common plane, spacer plates extending rearwardly of said channel-shaped intermediate section and secured in assembly with said attachment section, the spacer plates having a thickness exceeding the thickness of said beam so as to provide a vertical slot between the post and the post protector of a sufficient size to allow said beam to be positioned in assembled relation with the post between the post protector and the post, and attachment studs secured to said spacer plates for attachment of the post protector to said post.

4,113,111

LOAD HANDLING VEHICLE WITH HYDRAULIC TORSION TRANSMITTING DEVICES

Josef Theurer, Vienna; Wilhelm Praschl, Linz-Urfahr, and Klaus Riessberger, Vienna, all of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft M.B.H., Vienna, Austria

Filed Mar. 31, 1976, Ser. No. 672,276
Claims priority, application Austria, Apr. 25, 1975, 3222/75
Int. Cl.[2] B66C 23/00
U.S. Cl. 212—28 **8 Claims**



1. A vehicle comprising two undercarriages each having an axle carrying two wheels at respective end regions of the axle and a substantially rigid vehicle frame mounted on the undercarriages, a rotary load handling apparatus mounted on the vehicle frame for rotary movement thereon about a vertical axis and operative to apply a torsion force to said vehicle frame in one of the said end regions when lifting or supporting a load, spring means mounted between the undercarriages and the said vehicle frame as a yielding connection therebetween, and double-acting hydraulic torsion transmitting devices arranged separately and independently from the spring means, means mounting said torsion transmitting devices on the said undercarriages between the end regions of the axles and the said vehicle frame and being in force transmitting connection with the said frame, each of the said devices consisting of a cylinder member and a piston member dividing the cylinder member into an upper and a lower chamber, means connecting one of the said members directly to an associated one of the said undercarriages, and a respective conduit between the said upper chambers and the said lower chambers, respectively, of the said devices at corresponding end regions of the axles at each side of the vehicle, the conduits interconnecting the said upper and lower chambers of the said devices, respectively, for free and unobstructed flow of hydraulic fluid between the interconnected chambers, the said devices and interconnecting conduits forming a closed hydraulic system at each side of the vehicle, means connected to said conduits for selectively converting said torsion transmitting devices to shock absorbers, and the said cylinder chambers and conduits being filled with the hydraulic fluid whereby the torsional force in the said one end region is transmitted to the device in the one end region in a downward direction and to the interconnected device at the same side of the vehicle in an upward direction thereby twisting the said vehicle frame and distributing said force thereover.

4,113,112

CONSTANT BALANCE CRANE

Louis F. Ray, P.O. Box 14702, Baton Rouge, La. 70808

Filed Aug. 13, 1976, Ser. No. 714,228
Int. Cl.[2] B66C 19/00
U.S. Cl. 212—71 **6 Claims**

2. A constantly balanced crane comprising:

a tower assembly having an upper section and a base;

a horizontal gantry secured at a point intermediate its ends to the tower assembly between the base and the upper section;

a plurality of track means extending substantially the full

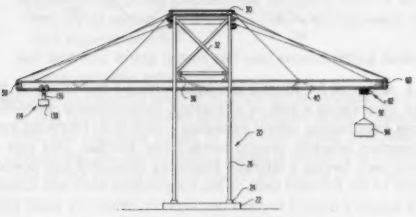
length of said gantry and through the center of said tower assembly and supporting a plurality of trolleys for bi-directional horizontal movement between the ends of said gantry and through the center of said tower assembly;

at least one of said trolleys being a lift trolley and having a lift mechanism for hoisting and lowering of objects to be moved;

at least one of the trolleys being a counterweight trolley and having a counterweight;

the trolleys each being horizontally movable in both directions through said intermediate point substantially the full length of the respective track means on which they are supported;

means to drive each of said trolleys along its respective track means;



separate manually actuated control means to activate said lift mechanism and to control horizontal movement of said lift trolley; and

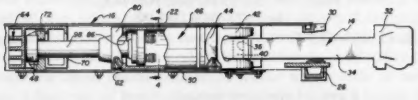
sensor means responsive to downward moments on the gantry occasioned by the load on the lift mechanism to actuate said drive means to horizontally move the counterweight to balance position so that the moments on both sides of the tower assembly are substantially equal, and for adjusting the counterweight to a horizontal position on either side of said tower assembly, during movement of the lift mechanism trolley along the length of its respective track means, to maintain said moments equal independently of the weight of the load and position of the lift trolley.

4,113,113

VALVE CLOSURE FOR RAILWAY CAR CUSHIONING DEVICE

James R. Reinhardt, and Mark P. Scott, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Sep. 16, 1977, Ser. No. 833,947
Int. Cl.[2] B61G *9/02*
U.S. Cl. 213—43 **9 Claims**



6. A fluid cushioning unit for railway cars comprising:

a cylinder having front and rear end portions, a piston mounted with the cylinder for reciprocal movement, a piston rod secured centrally to a face of the piston and extending through an opening in the rear end portion of the cylinder, said cylinder forming a high pressure chamber adjacent the front face of the piston and a low pressure chamber adjacent the rear face of the piston in which the piston rod is mounted, said piston having a plurality of openings therethrough between the low pressure and high pressure chambers; and

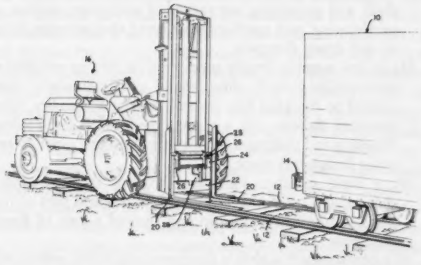
a metering valve mounted in each of said openings to control fluid flow between the low pressure chamber and the high pressure chamber and having a relatively large buff flow passage and a restricted draft flow passage, said metering valve comprising a movable buff member covering the buff flow passage and exposed to fluid pressure in the high pressure chamber, a buff spring urging the buff member toward a closed position of the buff flow passage, a movable draft member covering the draft flow passage and exposed to fluid pressure in the low pressure chamber, a draft spring urging the draft member toward a closed position of the draft flow passage, said draft spring and said buff spring being coiled springs arranged in concentric relation to each other, and means on at least one metering valve to restrict the flow of fluid through the buff flow passage adjacent the end of the buff travel thereby to reduce the amount of fluid being metered.

4,113,114

METHOD AND APPARATUS FOR RAILROAD CAR SHUNTING

William J. Pounds, 155 Velvet Dr., Jacksonville, Fla. 32220

Filed Mar. 14, 1977, Ser. No. 777,032
Int. Cl.[2] B61G *5/00*
U.S. Cl. 213—75 R **11 Claims**



1. A load-bearing coupling adaptor for connecting a vertically displaceable carriage of a fork-lift truck, said carriage including a horizontal rigid support member and said carriage carrying fork members attached to their inner end portions thereto and disposed below said support member, to a coupler of a railroad car, said coupler having a central hollow and a locking pivotable knuckle pivotally mounted to one side of said coupler, comprising:

a. means for mounting to said horizontal support member of said carriage;

b. a coupling pin for engaging said coupler, said pin having an upper end; and

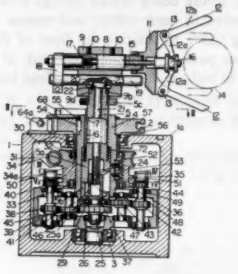
c. a load bearing member disposed above said inner end portions of said fork members, a first end of said load-bearing member rigidly connected to said means for mounting and said load bearing member extending outwardly therefrom and terminating in a second end which second end rigidly mounts said elongated coupling pin below its said upper end, the distance between said first and second ends being sufficiently great to accommodate such knuckle between said pin and said means for mounting and sufficiently small that said pin is disposed adjacent said carriage and above said inner end portions of said fork members.

4,113,115

MANIPULATOR

Hashimoto Yoshio, Hamamatsu, Japan, assignor to Kabushiki Kaisha Yachiyo Kogyo Kenkyusho, Hamamatsu, Japan

Filed Jun. 13, 1977, Ser. No. 805,840
Claims priority, application Japan, Jun. 18, 1976, 51-72056
Int. Cl.[2] B65G *47/90*
U.S. Cl. 214—1 BB **7 Claims**



1. A manipulator for industrial purposes, which comprises in combination:

(a) a housing;

(b) a main shaft held on both upper and lower surfaces of said housing in a rotatable manner;

(c) an auxiliary shaft concentrically fitted in said main shaft in a manner as to be rotatable together with said main shaft, and projecting outwardly of said upper surface of said housing, said auxiliary shaft being also movable in the up and down direction;

(d) an arm member fixedly supported on the top end part of said auxiliary shaft substantially perpendicularly with respect to the axial line thereof, said arm member being provided therein with a control mechanism for holding, releasing and shifting a work-piece from one place to any other designated place;

(e) a hand member for clamp-holding the work-piece therein, said hand being mounted on one end part of said arm, and having at the tip end thereof a pair of finger members;

(f) a control shaft which is concentrically fitted within said auxiliary shaft in a rotatable manner, and which operates said control mechanism for opening and closing said finger members provided on said arm member;

(g) a reversible electric motor fixedly provided on one external surface part of said housing;

(h) a worm gear member which is rotatably mounted on an outer peripheral surface part of said main shaft, and receives the driving force of said reversible electric motor through a worm provided on said motor and being meshed therewith;

(i) a group of gears for moving said auxiliary shaft in the up and down direction;

(j) another group of gears for rotating said control shaft;

(l) an intermittent gear which rotates along with said worm gear, and selectively transmits the driving force of said reversible electric motor to said both groups of gears to cause said auxiliary shaft to move up and down, or to cause said control shaft to rotate in either direction;

(m) means to cause said main shaft to follow the movement of said worm gear after said main shaft is rotated for a certain definite rotational angle; and

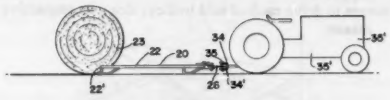
(n) means to detect rotation of said main shaft after the same is rotated for a certain definite angle, and to cause said reversible electric motor to rotate forwardly or reversely, said worm, worm gear, both gear groups, supporting frame, intermittent gear, and means for causing said main shaft to follow the movement of said worm gear being accommodated within said housing.

4,113,116

DEVICE FOR TOWING ROLLED BALES OF HAY

Paul W. Brandt, McHenry, N. Dak., assignor to David W. Brandt, McHenry, N. Dak.

Filed Apr. 26, 1977, Ser. No. 791,030
Int. Cl.[2] A01D *90/12*
U.S. Cl. 214—1 HA **5 Claims**



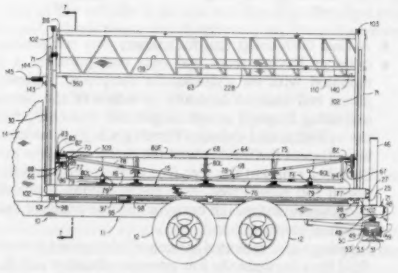
1. A device for towing and transporting a roll of hay or the like comprising a pair of elongated, longitudinally extending arms each having lateral extending points at its rearward ends extending laterally inward toward one another, said pair of arms each having a laterally extending elongated arm portion fixed to the forward ends of the longitudinal arms and extending laterally inward toward one another, relatively small plate means mounted to each of said arms at the lateral inner ends of said arm portions, pivotal connecting means acting to pivotally connect said arms and plate means together at the lateral inner ends of the arm portions, said relatively small plate means being relatively small in relation to the length of said arms, leverage means mounted between said small plate means closely adjacent said pivotal connection to lever said arms, whereby said leverage takes place relatively close to the pivot in relation to the rearward outer ends of the arms, said lever means being movably mounted to move forward to lever said plate means about the pivotal connection to lever the arms toward one another at their rearward outer ends, whereby when towing the device forward with the lever means attached to the vehicle and the points engaged to a roll of hay, the forward movement of the vehicle will move the device forward and the forward movement of the vehicle will also move the lever means forward to lever the lateral arm portions toward one another to thereby move the longitudinal arms and the points toward one another to tighten the hold of the points to the roll of hay.

4,113,117

ARTICLE HANDLING APPARATUS

Waymon Joe Douglas, 2905 Nakomi Dr., Lexington, Ky. 40503, and Wilburn Cleatus Douglas, Rte. 5, Nicholasville, Ky. 40356

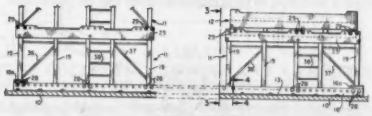
Filed Nov. 22, 1976, Ser. No. 743,787
Int. Cl.[2] B65G *15/26*
U.S. Cl. 214—8.5 C **21 Claims**



1. An article handling apparatus including:

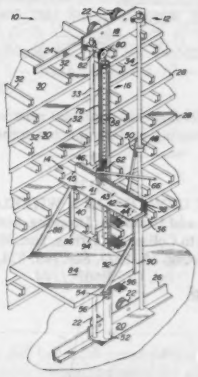
support means for supporting articles to be handled in a substantially horizontal position;
conveying means disposed in vertically spaced relation to said support means;
means to lift an article from said support means for disposition on said conveying means, said lifting means being supported by said support means;
said lifting means including disposing means to dispose the article in a substantially vertical position prior to being disposed on said conveying means;
said lifting means including:
first lifting means disposed on one side of said conveying means to lift articles from a first stack on said support means;
second lifting means disposed on the other side of said conveying means to lift articles from a second stack on said support means;
and said first lifting means and said second lifting means being movable separately;
and control means to control the separate movement of each of said first lifting means and said second lifting means so that said disposing means of only one of said first lifting means and said second lifting means is effective to dispose one of the articles on said conveying means at any time.

4,113,118
LOADING ARRANGEMENT
Nick P. Glumac, Chesterton, Ind., assignor to Toter-Tee, Inc., Chesterton, Ind.
Filed Jul. 26, 1976, Ser. No. 708,400
Int. Cl.[2] B65G *1/16*
U.S. Cl. 214—10.5 R **3 Claims**



1. A loading, stacking arrangement for load receiving pallets and the like and for mounting same securely to a loading platform including in combination, a pallet having a plurality of vertical legs adjacently and longitudinally arranged comprising side sections thereof, a base beam extending longitudinally beneath each said leg securely fastened thereto, a plurality of transverse cross beams connected to the upper ends of said legs, a first pair of lower channel members having a height in excess of the height of said base beams for closely encompassing and receiving the base beams beneath each side section, means for securing said lower channel members to said loading platform, a second pair of upper vertically oriented channel members attached to the upper ends of said side sections and to said cross beams, said upper pair of channel members being adapted to closely encompass and receive the base beams of a second pallet of similar configuration to the first mentioned pallet and adapted to rest upon said cross beams, said upper pair of channel members having a height in excess of the height of said base beams, and locking means for locking the respective base beams of said first mentioned and second pallets into respectively the lower and upper channel members receiving said respective base beams.

4,113,119
APPARATUS FOR LOADING ARTICLES ONTO VERTICALLY SPACED HORIZONTALLY DISPOSED SHELVES
William L. Brown, Easton, and Larry L. Reagan, Wind Gap, both of Pa., assignors to SI Handling Systems, Inc., Easton, Pa.
Filed Feb. 10, 1977, Ser. No. 767,267
Int. Cl.[2] B65G *1/04*
U.S. Cl. 214—16.4 A **9 Claims**

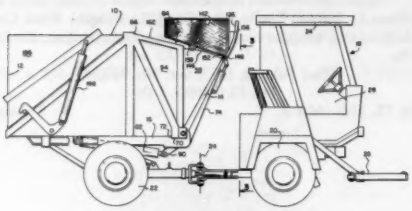


1. Apparatus comprising vertically spaced horizontally disposed shelves, said shelves having a discharge end and a replenishment end, a device adjacent the replenishment end of said shelves for loading articles onto said shelves, said device being guided by guide rails for reciprocating along the replenishment end of said shelves, said device including a pair of carriages spaced vertically from one another, each carriage having rollers for rolling engagement with one of said guide rails, at least one vertical member interconnecting said carriages, an article support surface, means supporting said article support surface so that the support surface may be manually moved relative to its support means to a position so that it partially overlies a replenishment end of one of said shelves, said surface support means being coupled to said vertical member for guided vertical movement by said vertical member, a hollow vertical member connected to one of said carriages and having a counterweight therein, the counterweight being connected to said surface support means by way of a cable extending around at least one pulley at the upper end of said device, said device having at least one case support shelf for supporting a case of articles prior to transfer of the articles from the case to said article support surface and for subsequent loading onto said shelves.

4,113,120
CONTAINER HANDLING AND TRANSPORTING APPARATUS
John W. Pickrell, 4206 N. 68th St., Scottsdale, Ariz. 85251
Filed Feb. 22, 1977, Ser. No. 770,398
Int. Cl.[2] B65F *3/02*
U.S. Cl. 214—38 D **17 Claims**

1. A vehicle chasis; a box like trash container removeably carried thereon; said container having a compactor side; first pivotal axis means; said compactor side being pivoted to said container by said first pivotal axis means; second pivotal axis means; a compactor actuator pivotally mounted on said chasis by said second pivotal axis means; means to selectively couple said compactor actuator to said compactor side of said container; and means on said chasis disposed to temporarily hold said container in such position thereon so as to temporarily

maintain said first and second pivotal axis means aligned on a common pivotal axis, means on said chassis and said compactor



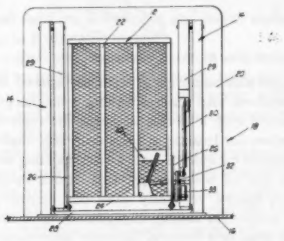
actuator for transferring said container relative to said chassis, and means for actuating said compactor actuator.

4,113,121

PIN RELEASE DEVICE FOR A WHEELCHAIR LIFT

Donald L. Collins, and Harold A. Downing, both of Hutchinson, Kans., assignors to Collins Industries, Inc., Hutchinson, Kans.

Filed Aug. 15, 1977, Ser. No. 824,533
Int. Cl.[2] B60P *1/44*
U.S. Cl. 214—75 R **4 Claims**



1. A pin release device for a wheelchair lift platform, the lift platform mounted in an opening of a vehicle and attached to a lift frame adjacent the opening, the lift platform is stored in a vertical position in the vehicle and lowered to a horizontal position for loading a wheelchair thereon, the device used for releasing the lift platform from the lift frame so that the lift platform may be lowered when the source of power normally used in lowering the lift platform fails, the device comprising:

an elongated handle pivotally mounted on the lift platform;

a pin arm attached at one end to said handle;

a pin slidably received in a pin guide mounted on the lift platform, one end of said pin attached to the other end of said pin arm, the other end of said pin releasably engaging the side of the lift frame; and

biasing means attached to the lift platform and said handle for pivoting said handle and holding said pin in engagement with the side of the lift frame.

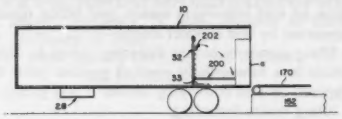
4,113,122

LOADING AND UNLOADING APPARATUS FOR VEHICLES

David Edward Lutz, 300 Washington La., Carlisle, Pa. 17103

Division of Ser. No. 543,608, Jan. 23, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,405
Int. Cl.[2] B60P *1/00*
U.S. Cl. 214—82 **2 Claims**

1. A loading and unloading apparatus for a vehicle having a framwork, a load carrying floor mounted on said framework, said floor having front and rear ends and a top surface, conveyor means on said floor supporting said load and moving said load longitudinally of said vehicle, bulkhead means connected to said conveyor between said load and said front end for assisting in moving loads from said front end to said rear end, said bulkhead being limited in its path of travel to the confines of said vehicle, a push bar attached to said bulkhead



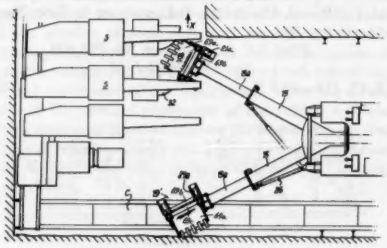
and movable from an inoperative vertical position to a horizontal load pushing position, said push bar being of sufficient length to push a load entirely from the vehicle at the rear thereof irrespective of the limitations on the travel of said bulkhead.

4,113,123

VEHICLE OR CARRIAGE MOUNTED MATERIALS TRANSPORTING MACHINE

Ian Campbell Jeffrey, Wigan, England, assignor to Dobson Park Industries Limited, Nottingham, England

Filed Sep. 26, 1975, Ser. No. 617,088
Claims priority, application United Kingdom, Sep. 27, 1974, 42086/74
Int. Cl.[2] E02F *3/44*
U.S. Cl. 214—141 **9 Claims**



8. A mining machine for transporting materials comprising in combination:

mobile support means including a chassis;

a boom assembly including a box-like yoke, including motion limit means comprising outwardly diverging side walls pivotally mounted directly on said chassis for motion about a generally horizontal axis and two independently operable booms having mutually exclusive arcs of opertion slidably extensible and retractable in the direction of their respective length pivotally supported on said yoke for constrained motion within predetermined limits defined by said motion limit means about a generally vertical axis;

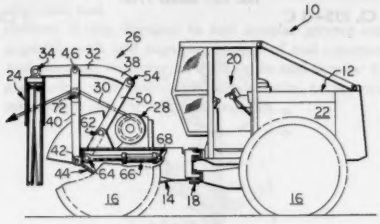
means for slidably extending and retracting said booms in a direction of their length and maneuvering said booms laterally and upwardly and downwardly including a piston and cylinder arrangement secured to and extending between said support means and said yoke for moving the booms upwardly and downwardly;

and a materials collecting, carrying and discharging means located on the end portion of each of said booms.

4,113,124
MOVABLE ARCH STRUCTURE FOR SKIDDER VEHICLE

John R. Muntjanoff, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 3, 1975, Ser. No. 554,936
Int. Cl.[2] B66C 1/42
U.S. Cl. 214—147 G 6 Claims



1. A movable arch unit for adjustably supporting a grapple on one end of a vehicle, comprising:

first and second links, each of said links being of a fixed length and being connected to structural portions of a vehicle in spaced apart relation along a longitudinal axis thereof,

a non-linear support beam pivotably connected at spaced apart locations to the other ends of the links,

an extended portion of the support beam including means for connection to the grapple, the link adjacent the extended end of the beam being the second and being substantially longer than the other first link, and

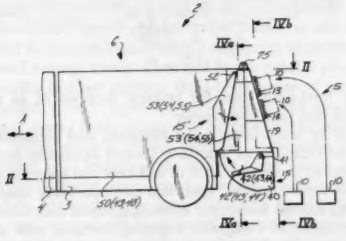
an extendable and retractable motor means substantially enclosed by structural portions of the vehicle and being pivotably interconnected between one of the links and the vehicle,

the one link interconnected with the motor means being pivoted at the one links connection to the structural portions of the vehicle between the support beam and the motor means so that the one link acts as a lever through which the motor means is operable to position the grapple.

4,113,125
REFUSE COLLECTING SYSTEM AND A VEHICLE AND CONTAINER FOR USE THEREIN

Rolf Schiller, Hoher Weg 8, D-7990 Friedrichshafen-Kluftern, Fed. Rep. of Germany

Filed Dec. 21, 1976, Ser. No. 752,845
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558433
Int. Cl.[2] B65F 3/02, 3/20, 3/28
U.S. Cl. 214—302 20 Claims

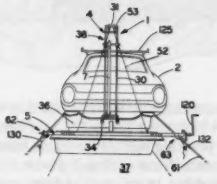


1. A system for accommodating and transporting materials, for example domestic refuse, comprising a collecting vehicle and a plurality of collecting containers, wherein the vehicle has two or more chambers for receiving the materials and wherein each collecting container has the same number of material receiving chambers as the vehicle so that when a collecting container is applied to the vehicle for transferring the materials from the collecting container to the vehicle, the several chambers of the vehicle are adjacent the respective chambers of the collecting container.

4,113,126
BOAT LOADER AND UNLOADER CONSTRUCTION

Allen M. Shotwell, 207 Simpson-Howell Rd., Elizabeth, Pa. 15037

Filed Aug. 19, 1977, Ser. No. 826,266
Int. Cl.[2] B60P 3/10
U.S. Cl. 214—450 23 Claims



1. Boat loader and unloader construction including:

(a) vertical column means having upper and lower ends, said lower end being adapted to be mounted on the rear of a vehicle and with said upper end being generally level with the top of the vehicle;

(b) carriage means having first and second ends, said carriage means being pivotally mounted on the upper end of the column means for swinging movement between a lower vertical position and an upper horizontal condition, and being slidably mounted on said upper column end for general horizontal movement between retracted and forward positions;

(c) clamp means mounted on the first end of the carriage means for clampingly engaging a transom of a boat;

(d) reel means adapted to be mounted on a central portion of a boat;

(e) cable means attached to and extending between the reel means and the second end of the carriage means, said cable means being controlled by the reel means to move a boat attached to the reel means between a horizontal upright position and a vertical upstanding position; and

(f) the carriage means being adapted to pivot about the upper end of the column means for swinging movement of a boat between a vertical upstanding position and an inverted horizontal position, and with said carriage means being adapted to move horizontally along the column means upper end for moving an inverted boat between retracted and forward positions on top of a vehicle.

4,113,127
VEHICLE TOP LOADING MECHANISM

Clyde H. Clement, 8439 N. 13th Pl., Phoenix, Ark. 85020

Filed Aug. 29, 1977, Ser. No. 828,503
Int. Cl.[2] B60R 9/00
U.S. Cl. 214—450 6 Claims

1. A loader adapted to be mounted on the top of a motor vehicle for raising objects from the ground alongside the vehicle to its top and for lowering objects from the top of the vehicle to the ground, the loader including in combination:

a base frame member having at least first and second opposite edges, the first edge of which is located near the edge of a vehicle top when the loader is mounted on the top of a motor vehicle;

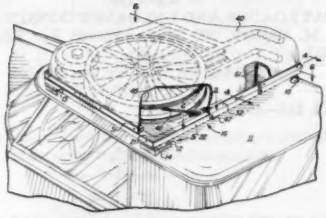
first hinge means attached to said base frame member near

the first edge thereof for mounting said base frame member to the vehicle top;

second hinge means;

a cover frame member overlying said base frame member and attached to the second edge of said base frame member by said second hinge means;

means for positioning said base frame member from a first substantially horizontal position on the vehicle top to a



second substantially vertical position extending upwardly from the first edge thereof at said first hinge means;

means for pivoting said cover frame member on said second hinge means from a closed position overlying said base frame member to an open position when said base frame member is in the second position thereof; and

means for loading objects into and unloading objects from the loader when said cover frame member is open and said base frame member is in said second position.

4,113,128

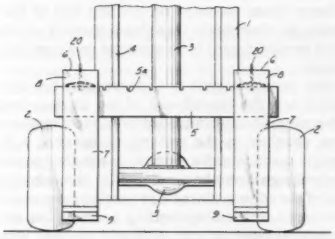
LIFT FORK CONSTRUCTION

Richard W. Foss, Thompson, Ohio, assignor to Jos. Dyson & Sons, Inc., Eastlake, Ohio

Filed Mar. 10, 1977, Ser. No. 776,283

Int. Cl.[2] B66F *9/14*

U.S. Cl. 214—750 **2 Claims**



1. In lift fork construction of the class described, in combination, a fork body, a hook portion at one end thereof to engage a transverse support member on a lift truck in which support member a series of spaced notches is formed, latch instrumentalities carried by a hook portion and selectively engageable with the notches aforesaid, means to maintain said latch instrumentalities in engaging position, means to prevent such engagement, the latch instrumentalities comprise an inverted T-shaped member, the vertical element thereof extending upwardly through the hook portion and the cross-arm constituting a plate-like element having a width approximating the width of a notch to engage with the notches and likewise prevent such engagement, and an operating part connected to the vertical element above the hook portion to manipulate the latch instrumentalities, resilient means engaging the said member to maintain the same in notch engaging position, the said resilient means comprising a flat spring, a recess in the hook portion to locate the flat spring, said recess being formed to prevent bending of the spring thereinto when the T-shaped member is raised by the operating part.

4,113,129

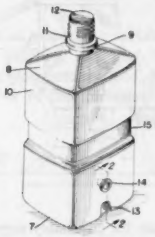
CONTAINER FOR STERILE LIQUIDS

Orlando D. Cambio, Jr., Bristol, Wis., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Filed Jan. 5, 1978, Ser. No. 867,043

Int. Cl.[2] B65D *1/06*

U.S. Cl. 215—1 C **6 Claims**



1. A blow-molded thermoplastic container for storing and dispensing liquids designed to be filled with said liquid during blow-molding comprising in combination a container having a body-portion, said body portion having a base portion, said body portion having a top portion, said top portion terminating in an elongated extending first neck, said neck terminating in a penetrable seal, said seal being contiguous with said neck and being formed during said blow-molding, a second relatively short neck extending outwardly from said body near substantially the base portion, said neck terminating in a penetrable seal, said seal being contiguous with said second neck and being formed during said blow-molding, a plug, said plug adapted and constructed to fit into a substantial portion of said second neck to thereby close any opening resulting when said seal of said second neck has been penetrated, a sealed depression in the body of said container adapted and constructed to frictionally retain said plug when said plug is not in use.

4,113,130

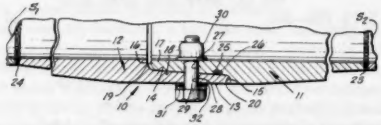
JOINT FOR A NESTABLE CARGO CARRIER

Webber W. Lazenby, Tulsa, and Daniel N. Pulliam, Broken Arrow, both of Okla., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 1, 1977, Ser. No. 820,930

Int. Cl.[2] B65D *7/02*; B64D *37/02*

U.S. Cl. 220—5 A **4 Claims**



4. A fluid-tight joint for nestable sections of an aircraft auxiliary fuel tank comprising:

a pair of cooperating joint elements, said elements being constructed from annularly formed extrusions and being secured to annular walls of said tank and forming ends for said sections of said tank, said elements being adapted for longitudinal telescopic interengagement and having circumferential elongated engaging surfaces, said surfaces being conically tapered, said elements having contoured distal end portions;

a plurality of radially extending and aligned openings through said elements and across said engaging surfaces;

bolts disposed through said openings radially to maintain engagement of said surfaces, each of said bolts being provided with an annular resilient seal between a head of said each of said bolts and a radially outermost surface of one of said pair of elements;

an annular groove opening into the engaging surface of the radially innermost of said pair of elements, said groove being longitudinally positioned intermediate said plurality of openings and said distal end of said innermost of said elements; and

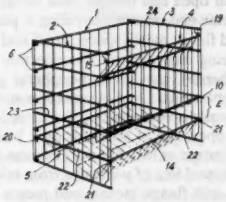
a resilient O-ring disposed in said annular groove and engageable with said engaging surface of said outermost of said elements whereby, in addition to said annular seal in association with said heads of said bolts, to provide the liquid-tight seal for said tank sections.

4,113,131

WIRE-NETTING BASKETS, BASKET HEIGHTENING DEVICES AND THE LIKE

Raymond Joseph, Schiltigheim, France, assignor to Ateliers Reunis Societe Anonyme, Schiltigheim, France

Filed Jul. 13, 1977, Ser. No. 815,366
Int. Cl.[2] B65D *7/20, 7/00, 7/24*
U.S. Cl. 220—19 **5 Claims**



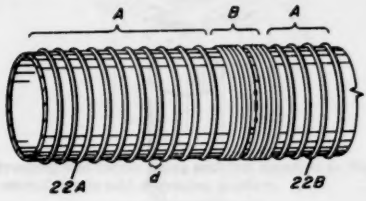
1. A container comprising four lateral panels to be assembled; first hook means of predetermined length located on the vertical edges of the first panel; first passage means provided on the rear vertical edges of the second and the third panels to be disposed in front of each other on either side of said first panel; said passage means being adapted to receive said hook means and being formed of a width commensurate with the length of said hook means so that said hook means may be received in said first passage means of said second and third panels without any possibility of being inadvertently loosened therefrom; second passage means provided at a lower portion of the front vertical edges of said second and third panels; third passage means provided at an upper portion of the front vertical edges of said second and third panels, second hook means of predetermined length at each lower corner of the fourth panel, said second hook means being adapted to be received by said second passage means when said fourth panel is placed on an outwardly inclined position; third hook means of predetermined length at each upper corner of the fourth panel, said third hook means being adapted to be received by said third passage means when a sliding moment is imparted to said fourth panel after engaging the second hook means of said fourth panel with said second passage means of said second and third panels, to thereby straighten said fourth panel to its final position, said second and third passage means having such a form and width as to prevent the fourth panel with said second and third hook means inserted respectively in said second and third passage means from being extracted out of the container by inadvertently pulling said fourth panel vertically upwards.

4,113,132

WIRE-WRAPPED CYLINDRICAL PRESTRESSED STRUCTURES

John E. Steiner, Edgewood Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 639,329, Dec. 10, 1975. This application Aug. 2, 1976, Ser. No. 710,952
Int. Cl.[2] B65D *7/44*
U.S. Cl. 220—71 **4 Claims**



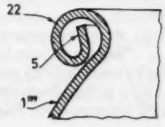
1. A wire reinforced pressure vessel comprising a cylindrical steel vessel and a length of wire wrapped around said cylindrical portion of the vessel such that the wire at the vessel midsection is wrapped with an open pitch and at the ends of said vessel, the wire is wrapped with a thread pitch to provide at least about 3 thread pitch hoops at each end of the cylindrical vessel, the ends of said wire secured in place by welding to the adjacent hoop and that portion of the wire wrapped with an open pitch is stressed to a greater extent than the portion wrapped with a thread pitch.

4,113,133

ROLLED EDGE IN CANS

Andre Berthet, Bellegarde, France, assignor to Cebal, Paris, France

Continuation of Ser. No. 595,772, Jul. 14, 1975, abandoned, which is a continuation of Ser. No. 366,492, Jun. 4, 1972, abandoned. This application Jan. 6, 1977, Ser. No. 757,135
Claims priority, application France, Jun. 5, 1972, 70.20123
Int. Cl.[2] B65D *7/44*
U.S. Cl. 220—74 **3 Claims**

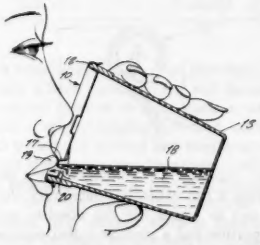


1. A rolled edge can for accomodating a product under pressure, having a rim extending outwardly from the upper edge of the can in which the rim consists essentially of a straight end portion and a circular rolled portion joining the straight end portion with the upper edge of the can, said rolled portion defining a circular section of more than 180°, with the straight portion extending angularly from the circular rolled portion into the space within the circular section and dimensioned to have a length greater than the internal radius of the circular rolled portion in which it is confined so as to resist unrolling, and in which the profile of the straight end portion is along a plane which passes through the axis of the can.

4,113,134
CAN CLOSURE
Leo A. Heintzelman, 4990 Burlingame, Wyoming, Mich. 49509
Filed Nov. 17, 1977, Ser. No. 852,258
Int. Cl.[2] B65D *51/18*
U.S. Cl. 220—256 3 Claims

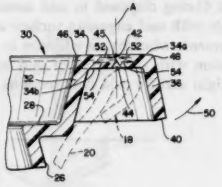
1. In a can type container having a substantially flat top with inner and outer surfaces:
the top having a circular opening of a given diameter formed therein;
the opening having a surrounding, interior flange joined to the can top by an integral fold portion;
a can closure for opening and closing said opening comprising a disc member within the can, said disc member being of a diameter at least greater than the given diameter of the opening;
an outer button having a substantially flat lower face, and a dome form upper surface;
a narrow stem connecting the disc member and the lower face of the button; and
said stem being of a length such that the button lower face is tightly frictionally engaged against the outer surface of can top, and the disc member is tightly frictionally engaged against the flange.

4,113,135
DRINKING CUP COVER
Takamitsu Yamazaki, 985 Shikawatashi, Yotsukaido-Machi, Chiba-ken, Japan
Filed Jun. 6, 1977, Ser. No. 803,587
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—268 4 Claims



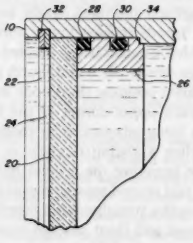
1. A disposable cover for a disposable drinking cup, comprising in combination, a circular disc formed of resilient think plastic, a circular groove on an underside of a periphery of said disc for snap-fitting on an upper edge of said cup, and a generally U-shaped slit on a central area framed by said groove forming a bendable tab, said tab having a hollow, raised rib along a free end edge thereof; said cover including a plurality of said tabs of different widths, a narrower width of said tabs having a higher said rib than a rib of the other.

4,113,136
TAMPER PROOF CONTAINER ASSEMBLY
Joseph L. Abbott, 2275 N. Cable, Apt. 184, Lima, Ohio 45087
Filed Jun. 6, 1977, Ser. No. 803,624
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—276 31 Claims



1. A reclosable container assembly comprising a container body having an open end, and a cover for closing said open end, said cover having wall means extending into said open end of said body, said body and said wall means having interengaging means providing a snap-fit therebetween releaseably holding said cover in place with respect to said open end of said body, said cover having peripheral flange means including a flange portion extending radially outwardly with respect to said body at said open end thereof, said flange means further including an outer end, means providing a peripheral line of weakness in said flange means spaced from said outer end, said flange means being independent of connection with said container body whereby any given peripheral portion of said flange means between said line of weakness and said outer end is free for pivotal displacement in the direction axially outwardly of said open end of said container body to stress the material of said cover at said line of weakness in the direction perpendicular to said line of weakness from said given peripheral portion of said flange means, said means providing said line of weakness providing for the material of said cover to rupture at said line of weakness in response to said pivotal displacement and under a force of displacement less than that required to release said cover from said container body.

4,113,137
CAMERA HOUSING OPTICAL SEALING METHOD AND DEVICE
Walter Jamison Wind, San Diego, Calif., assignor to Cohu, Inc., San Diego, Calif.
Filed Sep. 21, 1977, Ser. No. 835,242
Int. Cl.[2] B65D *45/32, 25/54, 53/00*
U.S. Cl. 220—319 9 Claims



1. An improved camera container sealing device of the type in which the container is closed by a removable end plate, wherein the improvement comprises:

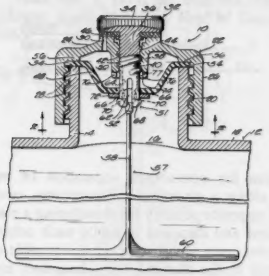
a seal retainer disposed within said container in close proximity to the inner surface of said container and end plate;
a substantially rectangular cross-section seal disposed between said end plate and said seal retainer;
a snap-ring groove disposed in the wall of said container; and
at least two snap-rings fitted within said groove to retain said end plate.

4,113,138

LIQUID TANK CAP HAVING A VENT

Ernest E. Fields, Shreveport, La., and Lester W. Reineck, Round Lake, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 11, 1977, Ser. No. 823,614
Int. Cl.[2] B65D *3/00, 51/16, 55/16*
U.S. Cl. 220—367 **19 Claims**



1. A cap for a liquid tank having a filler neck, said cap comprising a hollow body having a top wall portion for closing the filler neck and an annular flange depending from said top wall portion for releasably engaging the filler neck, a diaphragm disposed inside said body and spaced inwardly from said top wall portion to define a chamber therebetween, said diaphragm having a lowermost portion relative to the interior of the tank, a vent port in said top wall portion for communicating said chamber with the atmosphere, a closure member mounted on said top wall portion for selective reciprocative movement relative to said top wall portion between a first position to close said vent port and a second position to open said vent port, and means associated with said diaphragm lowermost portion and communicating the interior of the tank with said chamber for venting the tank to atmosphere when said closure member is in the second position and for draining liquid collected in said chamber back into the tank.

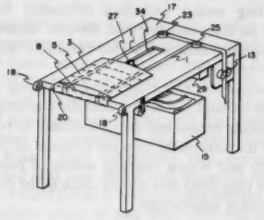
4,113,139

SEALED TAPED BAGS AND SEALED TAPE BAG DISPENSER

Lawrence James Berry, Amarillo, Tex., and Stanley Darwin Hall, Taylors, S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed May 12, 1977, Ser. No. 796,279
Int. Cl.[2] B65D *75/42*
U.S. Cl. 221—1 **5 Claims**

1. A method for dispensing flexible bags from a chain of imbricated bags, said bags being removably secured to a carrier, comprising the steps of:
moving said carrier in a first direction to dispose the leading bag of said chain of imbricated bags in a dispensing position, said bags having a closed end and an open end, said open and closed ends being connected by generally planar bag sides and substantially linear bag edges when said bags are in a flattened state, one of said sides adjacent said closed end being secured to said carrier, said carrier running substantially in the same direction as said edges, and said closed end preceding said open end in said first direction;
removing said lead bag from said chain along a path substantially oppositely opposed to said first direction; and



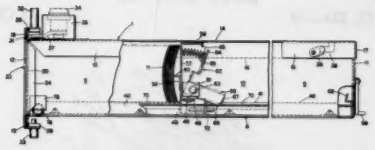
advancing said carrier along said first direction to dispose a second bag in said dispensing position.

4,113,140

SEALED TAMPER-INDICATING MONEY DISPENSING CONTAINERS FOR AUTOMATIC BANKING SYSTEMS

Harry T. Graef, Dover; Jack M. Richardson, Canton, and Robert P. Wolfarth, North Canton, all of Ohio, assignors to Diebold Incorporated, Canton, Ohio

Filed Jan. 21, 1977, Ser. No. 761,288
Int. Cl.[2] B65H *1/02*
U.S. Cl. 221—6 **30 Claims**



1. Banking equipment money dispensers of a type in which money dispensing picker mechanism removes paper money bills, one at a time, from a supply stack of such bills at a dispenser station, including:
(a) tamper-indicating paper money supply container means;
(b) retainer means at such dispenser station for the container means;
(c) the container means having walls forming a receiving compartment for a supply stack of paper money bills, said container walls being formed with access opening means throgh which such supply stack is loaded into the compartment at a loading station remote from said dispenser station, and which access opening means is adapted to communicate with money dispenser picker mechanism when the container means is retained at the dispenser station by said retainer means;
(d) closure means for the access opening means;
(e) the closure means including door means mounted on the container means for movement between closed and open positions;
(f) container sealing means including a lock member mounted on the container means, and means interengageable between the lock member, the closure means, and the container means holding the container closure means in sealed condition and the door means in closed condition when the lock member is locked;
(g) key means for the lock member including a first key located securely at the loading station, and a second similar key held captive by said retainer means at said dispenser station;
(h) the first key being operative at the loading station to unlock the lock member thereby permitting opening of the closure means for loading a stack of paper money bills

in said compartment through said access opening means and thereafter said first key being operative upon replacing the closure means to lock the lock member and to establish a container sealed condition of said container sealing means;

(i) coupling means including releasable interengageable means on the container and retainer means for coupling the container means in sealed condition with the retainer means; and

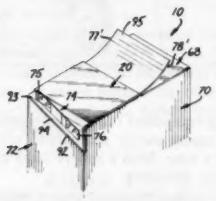
(j) the second key being operative to unlock the lock member and to hold the sealed container means coupled with the retainer means and simultaneously to release the door means for movement to open position to permit removal through said access opening means of paper money one bill at a time from said supply stack in the compartment by such picker mechanism.

4,113,141

DISPENSER PACKAGE FOR MAGNETIC TAPE SPLICING TABS

Mervin B. Kronfeld, Edina, Minn., assignor to Nortronics Company, Inc., Minneapolis, Minn.

Filed Oct. 20, 1976, Ser. No. 734,363
Int. Cl.² B65H *5/28*
U.S. Cl. 221—70 **3 Claims**



1. A dispensing unit for the itemized dispensing of adhesive tabs comprising:

(a) a roll of flexible backing material having parallel front and back edges;

(b) a plurality of trapezoidal tabs, each tab having a leading and a trailing portion, releaseably disposed obliquely on said backing material by means of an adhesive portion between said leading and trailing portions, said tabs being in such parallel, spaced relationship to one another that a line drawn through a trailing portion of any tab and intersecting said front and back edges at right angles intersects a portion of at least one other tab; and

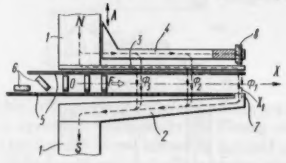
(c) a substantially closed housing wherein is disposed the roll, said housing including a side with an opening therein through which the backing material with the tabs thereon may be drawn, and a peeling edge adjacent the opening and along a line normal to the direction in which the backing material is drawn, over which the backing material may be further drawn, said opening being in the shape of a right triangle, said peeling edge defining one side of the triangle, and a second edge intersecting the peeling edge at an angle equal to the angle of obliquity at which the tabs are disposed on the roll defining the hypotenuse of the right triangle, so that as the leading portion of a tab is drawn over the peeling edge, one entire tab, and one only, is exposed exterior to the housing.

4,113,142

DEVICE FOR CONTACTLESS SEPARATION OF INDIVIDUAL FERROMAGNETIC COMPONENTS FROM A FLOW OF COMPONENTS

Vladimir Dmitrievich Ryzhov, ulitsa Pushkina, 167, kv. 14; Semen Kirillovich Litvinenko, ulitsa K. Marxa, 28, kv. 15; Roman Samuilovich Leikin, ulitsa Radionova, 18, all of Kurgan; Anton Yanovich Kulberg, prospekt Komarova, 59, kv. 92, Riga; Benyamin Alexandrovich Ioffe, ulitsa Stirnu, 37 a, kv. 44, Riga, and Robert Karlovich Kalnin, ulitsa Gorkogo, 53, kv. 19, Riga, all of U.S.S.R.

Filed Jul. 12, 1976, Ser. No. 704,693
Claims priority, application U.S.S.R., Jul. 14, 1975, 2155109
Int. Cl.² B23Q *7/18*; B65G *35/00*
U.S. Cl. 221—171 **2 Claims**



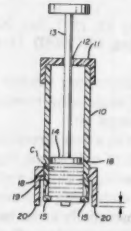
1. Apparatus for contactless separation of magnetizable components along a given path comprising, two elongated polepieces of opposite polarity for developing a magnetic field when energized and disposed opposite each other defining a channel therebetween along which magnetizable components move in a flow in the channel, two elongated, non-magnetic guards between the polepieces defining the path along with said components travel in said channel, said polepieces having a configuration defining the channel as a progressively narrowing channel in the direction of travel of said components in said flow, and developing a magnetic field of increasing intensity in the direction of travel of said components, one of said polepieces having a projection extending inwardly toward the channel and saturable with flux thereby to abruptly increase the intensity of a magnetic field developed by said polepieces at a narrowest point of said channel to accelerate a leading one of the components into a position separate from the other components in said flow, and two opposed magnetic shunts parallel with each other and adjustabe axially toward and away from said channel at points aligned with said projection thereby to increase the intensity of said magnetic field at said narrowest point of said channel.

4,113,143

BINGO CHIP DISPENSER

Raymond J. Spagnola, Jr., 707 Moore Ave., Campbell, Ohio 44405

Filed Mar. 2, 1977, Ser. No. 773,782
Int. Cl.² B65G *59/06*
U.S. Cl. 221—267 **5 Claims**



1. A bingo chip dispenser comprising a cylindrical body member open at one end and having a plunger movably posi-

tioned therein and extending out of the opposite end, a cylindrical thin wall portion on said cylindrical body member adjacent said open end defining a continuous ring-like member, a pair of oppositely disposed inwardly extending detents formed on said ring-like member, said ring-like member being distortable from a normally circular shape to an oval shape whereby bingo chips in said dispenser may be moved past said detents by said plunger and means on said cylindrical body normally spacing said ring-like member and the detents thereon above a supporting surface on which said chips are to be dispensed.

4,113,144

SYRINGES ADAPTED TO OVERCOME A PRESSURE RESISTANCE

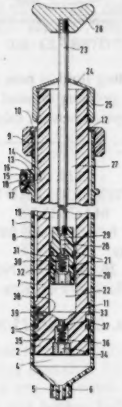
Wolfgang Hein, Hahnstrasse, 3354 Dassel; Peter Grundmann, Amselweg, 5330 Konigswinter, and Claus Cosack, Südstrasse, 3354 Dassel, all of Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,714

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1976, 2615366

Int. Cl.[2] B65D *83/14*

U.S. Cl. 222—396 **5 Claims**



1. A syringe for expelling a liquid medium for filtration, said syringe comprising:

a first cylinder cooperating with a first piston having a first hollow piston rod and defining a first pressure chamber, the hollow portion of said hollow piston rod defining a second cylinder having a smaller cross section than said first cylinder and cooperating with a second piston having a second piston rod and defining in said second cylinder a second pressure chamber, the space between said first cylinder and said first hollow piston rod defining a first piston rod chamber;

a cap on the rear of said piston rod with its inner diameter forming a gap relative to said second piston rod, said cap limiting the stroke of said second piston rod by abutment with the latter;

an axial duct formed within said first piston connnecting said first and second pressure chambers;

a check valve in said duct having a valve closure element and means biasing said valve closure element to open the valve upon an over-pressure in said second pressure chamber;

an inlet/outlet attachment on said first cylinder for the liquid medium opening into said first pressure chamber;

a second duct formed in said second piston opening into said second pressure chamber;

a second check valve in said second duct that opens in response to an under-pressure in said second pressure chamber during an air intake stroke of said second piston and that closes in response to an air over-pressure in said second pressure chamber during an air pressurizing stroke of said second piston;

a second cap for said first cylinder with its inner diameter forming a gap relative to the outer surface of said first piston rod;

a stop on said first piston which is able to abut said second cap in the extreme intake stroke position of the first piston, with said liquid medium charged into said first pressure chamber by means of an intake stroke of the first piston being expelled by means of an air over-pressure provided upon said liquid medium within said first pressure chamber by means of a pumping action of said second piston;

a pressure release duct connecting said second pressure chamber and said first piston rod chamber forwardly of the most forward point of travel of said second piston; and

a pressure safety valve in said duct that opens when the pressure in the said first and second pressure chambers exceeds a predetermined pressure to thereby equalize the pressure of said liquid medium in said first and second pressure chambers and prevent bursting of said first cylinder.

4,113,145

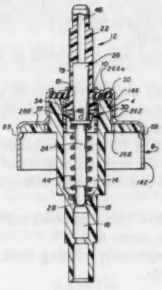
DISPENSING UNIT FOR LIQUID AND METHOD OF DISPENSING

Philip Meshberg, 85 Old Oaks Rd., Fairfield, Conn. 06430

Continuation-in-part of Ser. No. 339,129, Mar. 8, 1973, abandoned. This application Nov. 20, 1975, Ser. No. 633,799

Int. Cl.[2] B05B *11/02*; G01F *11/02*

U.S. Cl. 222—1 **31 Claims**



1. The method of operating a pump assembly for dispensing a liquid from and admitting air to a sealed container, said pump assembly including a plunger having a discharge passage, which is depressed to carry out said dispensing and admitting, a pump chamber having an inlet opening and terminating in a surface for receiving a sealing disc; a piston disposed in said pump chamber with the pump plunger operatively coupled to said piston and extending from said pump chamber; an annular sealing disc disposed over said pump chamber and surrounding said plunger and means overlying said sealing disc for attaching said pump to the container comprising:

(a) operating a positive seal valve member to terminate fluid flow through the inlet opening in said pump chamber upon an initial, first predetermined motion of said plunger;

(b) opening a discharge port beneath said piston, to place said pump chamber in communication with the discharge passage in said plunger;

(c) forming a vent passage between cooperating surfaces of the plunger, the sealing disc, the pump chamber and the container upon said plunger being slid a predetermined distance through said sealing disc;

(d) dispensing liquid by further operation of said plunger;

(e) urging said piston and said plunger upward; and

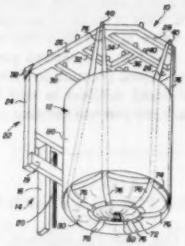
(f) preventing communication between the atmosphere and said vent passage upon the plunger reaching its fully raised position, by contacting means associated with said plunger against the sealing disc to thereby seal the container against leakage.

4,113,146

DISPOSABLE CONTAINER FOR BULK MATERIALS

Robert R. Williamson, Dallas, Tex., assignor to Better Agricultural Goals Corporation, Dallas, Tex.

Filed Apr. 11, 1974, Ser. No. 460,053
Int. Cl.[2] B65D *33/14, 33/28*
U.S. Cl. 222—105 **26 Claims**



1. A receptacle for flowable material comprising:
a bag of flexible sheet material defining a chamber for said materials;
said bag being formed from sheet material wrapped in a spiral with the edges adhesively attached together to form a cylindrical wall;
said sheet material being doubled to form a double walled bag;
straps attached to said sheet material at spaced locations on the exterior thereof for supporting said receptacle in a normal orientation;
selectively closable fill and discharge ports positioned, respectively, at the top and bottom of said receptacle when in said normal orientation for filling and discharging material;
the double walls of said bag being separate adjacent said fill and discharge ports; and
tie means for separately closing both walls at the fill and discharge ports.

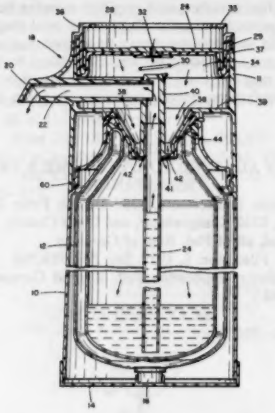
4,113,147

VACUUM BOTTLE WITH AIR PUMP TO PRESSURIZED BOTTLE TO EFFECT DISPENSING

Albert A. Frazier, Nashville, and Howard W. Phillips, Brentwood, both of Tenn., assignors to Aladdin Industries, Incorporated, Nashville, Tenn.

Continuation-in-part of Ser. No. 803,736, Jun. 6, 1977, abandoned. This application Sep. 29, 1977, Ser. No. 837,519
Int. Cl.[2] F04B *43/02;* B65D *47/34;* B67D *5/42, 5/54*
U.S. Cl. 222—131 **17 Claims**

15. A manually operated pump dispenser for a container comprising:
(a) a pump housing defining an interior space and having a first opening therein and at least one opening through the bottom of said housing, the latter opening for communicating said interior space with the interior of said container,
(b) means positioned in said housing for pumping air into said container including:
(i) a rigid force applying member positioned directly beneath said first opening and accessible therethrough for direct user actuation,
(ii) a flexible diaphragm including an outer portion which doubles back on itself disposed directly beneath said force applying member and in contact therewith, the outer edge of said diaphragm secured in position against said housing,



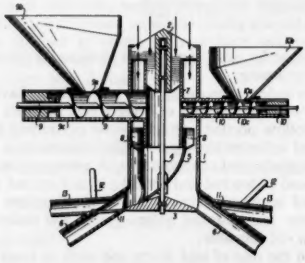
(c) means for permitting fluid to pass out of the container in response to the air pressure created in said container from the downward displacement of said pumping means.

4,113,148

DISPERSER HEAD FOR SEED AND FERTILIZER DRILL MACHINES

Ludwig Ernst, No. 26, Felderstrasse, 8831 Markt Berolzheim, Fed. Rep. of Germany

Filed Jan. 26, 1977, Ser. No. 762,688
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1976, 2603088
Int. Cl.[2] A01C *15/04*
U.S. Cl. 222—139 **13 Claims**



1. A disperser head for seed and fertilizer drill machines adapted to be driven by an air stream and comprising:
(a) an elongated, substantially vertically oriented housing having side walls and being closed at its lower end;
(b) a disperser element;
(c) means mounting said disperser element in said housing for free rotation about a substantially vertical axis with an annular space between the exterior of said disperser element and the interior of said housing;
(d) a plurality of discharge openings spaced about said housing in a plane perpendicular to said axis adjacent the lower end of said housing;
(e) said disperser element including an opening at the top thereof for receiving said seed and fertilizer, a discharge

port in one side adjacent the bottom thereof confronting said discharge openings in said housing during rotation of said disperser element, a downwardly sloping wall extending from the opposite side to said one side for directing said seed and fertilizer towards said discharge port; and a plurality of helically oriented drive blades in said annular space about the exterior of said disperser element and extending towards the interior of said housing, whereby a portion of a downwardly flowing air stream passes through said disperser element and the remaining portion thereof passes between said drive blades in said annular space between said disperser element and said housing to drive said disperser element; and

(f) separate means for feeding said seed and fertilizer respectively through the side walls of said housing and into the top of said disperser element;

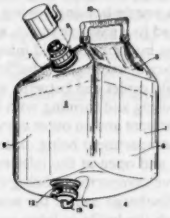
(g) whereby said seed and fertilizer form a mixture in said disperser element which is distributed through said discharge opening in said housing.

4,113,149

PORTABLE WATER SOURCE

Gustav Harsch, 2115 Orchard St., Santa Rosa, Calif. 95404

Filed Mar. 25, 1977, Ser. No. 781,199
Int. Cl.[2] B67D *5/06*
U.S. Cl. 222—181 **1 Claim**



1. A portable water source, comprising

a plastic waterproof container for storing water, said container having a top, a bottom and a plurality of sides joining the top and bottom, said container having a top hole formed through the top and a bottom hole formed through the bottom;

a combination cap and spout device affixed to the top of the container and covering the top hole for selectively pouring water out of the container when said container is used in the manner of a bucket;

a handle affixed to and extending from the top of the container to facilitate holding said container when used in the manner of a bucket and to support said container from an overhead supporting member via a cord when said container is used as a water source;

a spigot device affixed to the bottom of the container and covering the bottom hole for selectively pouring water out of the container at a desired rate of flow when said container is used as a water source, said spigot device having a spigot handle outside said container for manual control of the water flow; and

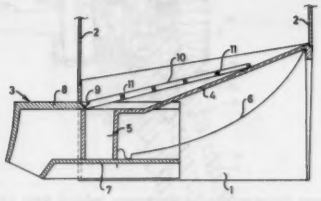
volume control means in the container at the bottom in the area of the bottom hole for adjusting the volume of water passing into the spigot device, said volume control means comprising an inner housing having a bottom with flow holes formed therethrough and a stopper extending from the bottom thereof, said inner housing being threadedly coupled in the container with the stopper positioned a desired distance from the bottom hole of the container whereby water in said container flows into said inner housing and through the flow holes of said inner housing and is restricted in volume at said bottom hole of said container in accordance with the distance between said stopper and said bottom hole.

4,113,150

DISPENSER FOR GROUND COFFEE AND OTHER POWDERED PRODUCTS

Steen Ostergaard, No. 68 Kildeskovsvej, 2820 Gentofte, Denmark

Filed Dec. 27, 1976, Ser. No. 754,696
Int. Cl.[2] G01F *11/18*
U.S. Cl. 222—243 **1 Claim**



1. A dispenser for ground coffee and other powdered products, comprising:

a storage container having a bottom wall,

an outlet spout constituting a stationary measuring chamber and formed integrally with said bottom wall and having upper and lower open ends,

a valve member that is displaceable between a projected and a retracted position and includes upper and lower walls so arranged relative to said spout that said upper wall obstructs said upper end of the spout when the valve member is displaced toward its retracted position while said lower wall in the same situation does not obstruct said lower end of the spout, and

an agitator means formed integrally with said valve member and placed closely above said bottom wall, wherein said bottom wall is inclined downwardly toward said upper end of the spout, said agitator means being of ladder formation and at one end being connected to said upper wall while at its other end the agitator means rests slidably on said inclined bottom wall.

4,113,151

DISPENSING GUN

Robert M. Brown, Kalamazoo, and Rudolf R. Karliner, Portage, both of Mich., assignors to Valley Hydro-Luft, Inc., Kalamazoo, Mich.

Continuation-in-part of Ser. No. 631,317, Nov. 12, 1975, abandoned. This application Sep. 15, 1976, Ser. No. 723,465
Int. Cl.[2] G01F *11/00*
U.S. Cl. 222—324 **13 Claims**

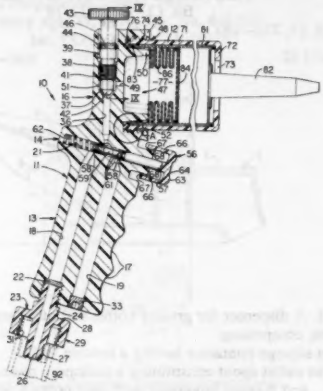
1. In a fluid operated dispensing gun for dispensing a viscous material, said gun having means defining a hand grip and means defining a barrel receiving portion on which a barrel is releasably secured and wherein a disposable cylindrical cartridge containing said viscous material and formed with an outlet for dispensing said viscous material therefrom has a rear cylindrical rim and is equipped with a piston-like rear wall, said viscous material being located between said piston-like rear wall and said outlet, said cartridge being positioned inside said barrel of said gun for advance of said piston-like rear wall of said cartridge toward said outlet by pressurized fluid introduced into the rear end of said barrel on the rear side of said piston-like rear wall, the improvement comprising:

fluid passageway means in said hand grip means and said barrel receiving portion for providing a fluid passageway to said rear end of said barrel;

first manually operated valve means on said hand grip means

and in said fluid passageway means for opening and closing said fluid passageway means;

second manually operated flow rate control valve means on said barrel receiving portion and in said fluid passageway means between said first valve means and said rear end of said barrel and being independent of said first manually operated valve means for controlling the rate of flow of said fluid through said fluid passageway means and said



rear end of said barrel to thereby control the rate at which said piston-like rear wall is advanced toward said outlet and the rate at which said viscous material is ejected from said outlet; and

a bleeder hole in said barrel receiving portion providing fluid communication between said rear end of said barrel and the atmosphere, said fluid communication being controlled by said second manually operated valve means.

4,113,152

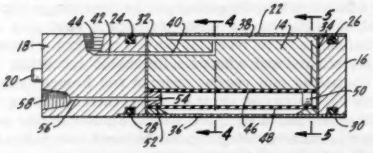
ADHESIVE DISPENSING DEVICE

Robert W. Schmidt, 5744 W. 77th St., Oak Lawn, Ill. 60459

Filed Mar. 14, 1977, Ser. No. 777,022

Int. Cl.[2] B05C 5/02

U.S. Cl. 222—485 **8 Claims**



8. A means for dispensing adhesive including a housing, an adhesive chamber in said housing, a sleeve positioned circumferentially about said housing with said chamber extending circumferentially within said sleeve, a plurality of openings in said sleeve in communication with said chamber, and an inflatable member in said chamber adjacent said sleeve openings, said inflatable member closing said openings when inflated.

4,113,153

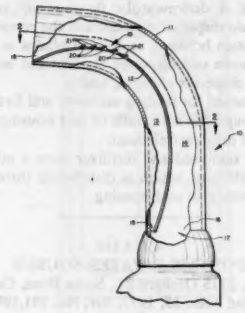
GAS PUMP NOZZLE

James H. Wellman, 1809 San Andres, Santa Barbara, Calif. 93101

Filed Apr. 29, 1977, Ser. No. 792,463

Int. Cl.[2] B65D 25/40

U.S. Cl. 222—571 **3 Claims**



1. A nozzle for use with gasoline pumps and the like, comprising

a gasoline pump nozzle housing having an inlet end adapted to be connected to a gasoline pump, a discharge end and a curved portion intermediate said inlet and discharge ends;

a baffle in the nozzle housing, said baffle extending from said inlet end to said outlet end between opposite side walls of the nozzle housing and forming with said housing an inner curve compartment and an outer curve compartment, said inner curve compartment being closed at a discharge end of the nozzle and open at the inlet end of the nozzle and the outer curve compartment being open at both the inlet end and the discharge end of the nozzle;

openings through the baffle to interconnect the inner curve compartment and the outer curve compartment, said openings being between said curved portion of said nozzle and said discharge end thereof; and

a louver adjacent each opening through the baffle, at least one of said louvers being at the downstream side of an opening when flow is being pumped through the housing from said inlet end to said outlet end, said louvers extending from said baffle into said outer curve compartment to channel the flow of excess fluid into said inner curve compartment.

4,113,154

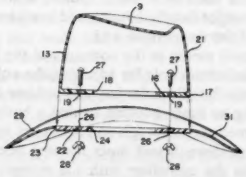
CONVERTIBLE HAT BLOCKING STRUCTURE

Marvin L. Emmons, 2463 NW. Dallas St., Grand Prairie, Tex. 75050

Filed Mar. 7, 1977, Ser. No. 775,245

Int. Cl.[2] A42C 1/00

U.S. Cl. 223—24 **1 Claim**



1. A convertible hat blocking structure for simultaneously blocking hats having a variety of styles of crowns and brims, said hat blocking structure comprising:

a crown portion selected from a plurality of differently styled crown portions, said selected crown portion constituting a rigid body having an open end and a hollow interior defined by a generally ovate side wall and a top surface, said side wall and top surface being selectively depressed inwardly so as to be configured in the form of a selected hat crown style;

means secured to and at least partially closing the open end of said crown portion and including spaced apertures to receive fasteners;

a brim portion selected from a plurality of differently styled brim portions, said selected brim portion constituting a rigid body having an inner portion conforming generally in size and shape to the open end of the crown portion and an outer brim support portion extending radially outwardly from and integral with said inner portion, said brim support portion providing on its top surface a configuration corresponding to a selected hat brim style, said inner portion including spaced apertures to receive fasteners; and

fastener means interposed between said means closing the open end of said crown portion and said brim portion and passing through corresponding spaced apertures therein for detachably fastening said crown and brim portions together in superposed relationship with said crown portion resting on the upper surface of said brim portion to produce a hat blocking structure having selected crown and brim portions which individually conform to selected crown and brim styles whereby a hat to be blocked may be draped over said crown and brim portions and be molded to the configuraton thereof to provide a hat having said selected crown and brim styles.

4,113,155

NEEDLE

Mabel K. Gibby, 4501 Granda Blvd., Coral Gables, Fla. 33146

Filed Jul. 22, 1977, Ser. No. 818,055
Int. Cl.² D05B *55/00*
U.S. Cl. 223—102 **4 Claims**

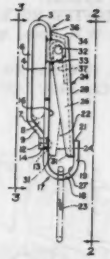
1. An improved sewing needle for drawing thread through fabric comprising a needle length having a first end and a second end and a smooth outer surface, said needle being provided with a single eye adjacent the second end, said needle being generally circular in cross section between each of the ends and the eye, and an end zone being defined between said eye and said second end, said second end defining a rounded distal nose portion pusher means of a diameter no greater than but substantially equal to the maximum cross sectional area of the needle between the ends and the eye and defining a pusher zone for pushing the needle through cloth in sewing, and wherein the second end is rounded and smooth presenting a pad pusher surface.

4,113,156

KEY RING HOLDER

Teodoro Guzman Brito, 5714 Rotterdam La., San Jose, Calif. 95118

Filed Feb. 3, 1977, Ser. No. 765,267
Int. Cl.² A45F *5/02*
U.S. Cl. 224—5 R **3 Claims**



1. A key ring holder comprising an elongated metal strip having:

a main body portion forming an integral part of said strip;

a belt-engaging re-entrant portion having a U-shaped upper end smoothly joining and forming an integral extension of the upper end of said main body portion, said re-entrant portion extending downwardly from said U-shaped upper end in spaced parallel alignment with a first surface of said main body portion and extending along a major portion of the length thereof, the lower, free end portion of said re-entrant portion being jogged inwardly so as to engage said main body portion at a point adjacent the lower end thereof;

a second, U-shaped, key-supporting re-entrant portion at the lower end of, and constituting an integral extension of, said main body portion, said second re-entrant portion having a bend portion smoothly joining said main body portion to a free leg portion extending upwardly, said free leg portion being substantially parallel to a second surface of said main body portion, in spaced alignment therewith, and terminating in a plane substantially including the point of engagement of said first mentioned re-entrant portion with said main body portion, said second re-entrant portion forming a relatively shallow hook within which may be supported a key ring, the U shape of said shallow hook defining an opening between said leg portion and said main body portion through which a key ring must pass in order to be suspended in said hook;

an enlarged flat section integral with and coplanar with said main body portion, located intermediate the upper and lower ends of said main body portion, and extending from opposite edges thereof to provide sufficient width to prevent twisting of said key ring holder on the belt of a wearer;

a pair of lugs integral with and perpendicular to the plane of said second surface of said main body portion of said strip projecting from opposite edges thereof, said second pair of lugs being parallel to each other and located adjacent the upper end of said main body portion;

a locking lever in the form of a channel having a web, integral, parallel flanges extending the full length of the web to form a rigid beam, and an end flange to close one end of said channel;

mounting means adjacent the closed end of said channel pivotally mounting said locking lever on said pair of lugs, the open side of said channel facing said main body portion with the free end of the locking lever extending into the opening of said hook for resilient impingement against the free leg portion of said hook; and

spring means interposed between said main body portion

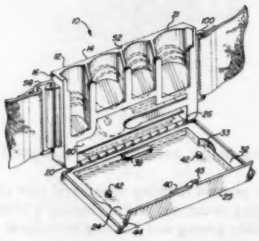
and said locking lever and disposed between said pair of lugs to resiliently bias the free end of said locking lever away from said main body portion toward engagement with said free leg portion of said hook to maintain said opening in a locked condition to preclude the inadvertent release therefrom of a key ring held therein.

4,113,157

COMPARTMENTED RECEPTACLE

Dean F. Woodbury, 2202 W.N. Loop, Apt. 247, Austin, Tex. 78756

Filed Mar. 8, 1976, Ser. No. 664,585
Int. Cl.[2] A45C *1/04*
U.S. Cl. 224—26 E **8 Claims**



1. A receptacle for receiving and storing in an organized, convenient manner items such as coins, currency, credit cards and the like comprising:

(a) a first storage section including a rear plate having an inner and outer surface, a top edge, a bottom edge, and opposite sidewalls;

(b) at least one coin receiving channel in said first storage section including:

(i) first and second generally parallel spaced apart flanges upstanding from said inner surface, said inner surface being generally concave between said flanges,

(ii) lip means on said flanges generally parallel to said rear plate and defining an elongated opening therebetween;

(iii) a transverse end wall extending beneath and between said flanges and defining a generally obtuse angle with respect to said rear plate; and

(iv) the upper end of said coin receiving channel defining an opening free of obstruction whereby coins can be stacked in said channel in angled, partially overlapping arrangement for convenient manual engagement via said elongated opening and removal through said top opening;

(c) compartment means in said first storage section located subjacent said end wall of said coin receiving channel adapted for receipt of currency or similar items;

(d) a second storage section complementary with said first storage section when the receptacle is in a closed position, said second storage section having a front wall with inner and outer surfaces, peripheral top, bottom and side edges extending around the inner surface of said front wall and defining a generally rectangular document receiving compartment, said document receiving compartment being configured and sized to accommodate credit cards and including means for securing said credit cards in a position for convenient insertion and removal; and

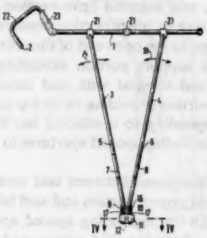
(e) releasing locking means for holding said receptacle in the closed position with the first and second sections in complementary relationship having the size and appearance in the closed position of a belt buckle with the peripheral top edge of the second storage section overlying and closing the upper end of the coin receiving channel of the first storage section.

4,113,158

LUGGAGE CARRIER FOR TWO-WHEEL VEHICLES, SUCH AS BICYCLES

Heinz Niemann, Herford, Fed. Rep. of Germany, assignor to ESGE-MARBY GmbH & Co., Bielefeld, Fed. Rep. of Germany

Filed Mar. 10, 1977, Ser. No. 776,421
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 7617628[U]
Int. Cl.[2] B62J *7/04*
U.S. Cl. 224—39 **9 Claims**



1. Luggage carrier for cycles, such as bicycles, having a cycle frame, said carrier comprising

an elongated support frame (1) defining a support plane and having means (2) at one end to secure the support frame to the cycle frame;

two support rod pairs (3, 4) each pair being pivotally secured to the support frame, the rods of each pair being located at a respective side of the support frame and projecting towards the axle of a rear wheel of the cycle, the pairs being staggered along the length of the support frame,

whereby the carrier will be supported at three longitudinally staggered points along the length of the support frame

and wherein the free end portions (9, 10) of adjacent rods (5, 6; 7, 8) of the support rod pairs (3, 4) are angled with respect to the remainder of the rods and are approximately parallel to each other when placed adjacent each other and adjustable with respect to each other and the rear end portion of the cycle frame (13) so as to adjust the position of the support frame with respect to the rear wheel,

an attachment claw clamp (11) fitting around the approximately parallel free ends (9, 10) of the angled portions of the rods to clamp the free end portions of the rods against the rear end portion of the cycle frame (13), the claw clamp being formed with a bore (12);

and a clamping bolt to adjustably tighten the claw clamp to the rear end portion of the cycle frame (13) each of the free end portions of the rods held in an individually relative adjusted position between the clamp and the rear end of the cycle frame.

4,113,159

SHOE RETAINING AND CARRYING DEVICE

Ivor J. Allsop, 2079 N. Shore Rd., Bellingham, Wash. 98225

Filed Nov. 3, 1977, Ser. No. 848,098
Int. Cl.[2] B65D *71/00*
U.S. Cl. 224—45 S **23 Claims**

1. A combination shoe retaining and carrying apparatus, said apparatus comprising:

a. a base structure providing a support platform adapted to support at least one shoe thereon,

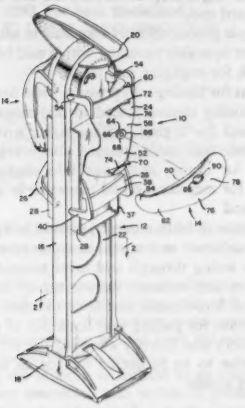
b. a first shoe retaining member mounted by an inner end thereof at one end of said platform, and having an outer end to extend outwardly from said platform to engage one end of a shoe on said platform,

c. a second shoe retaining member mounted at said platform at a location spaced from said first retaining member and

arranged to extend from said platform to engage a second end of said shoe on said platform,

d. a shoe horn-type shoe manipulating device comprising an elongate foot engaging portion and a handle portion extending laterally from said foot engaging portion,

e. mounting means to removably attach said shoe manipulating device to said first retaining member, said mounting means arranged to position the handle portion of the shoe



manipulating device in a laterally extending shoe retaining position over said platform so as to extend over a shoe retained on said platform,

whereby said shoe manipulating device can be removed from said apparatus to be used in putting on a shoe retained on said apparatus, and with said shoe being placed on said apparatus to be retained thereby, said shoe manipulating device is able to perform an auxiliary shoe retaining function to hold said shoe more securely to the apparatus.

4,113,160

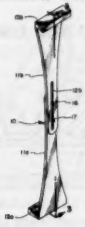
SHEET SLING

Dennis D. Spiers, 2688 N. 650 E., Ogden, Utah 84404

Filed Jan. 13, 1977, Ser. No. 759,078

Int. Cl.[2] B65G 7/12

U.S. Cl. 224—45 R **5 Claims**



1. An adjustable hand held carrier for transporting sheets of material comprising two adjustable pieces having substantially the same dimensions being adjustably secured together in backwardly facing and extending positions thereby having similar adjoining ends and similar opposing ends, said adjoining ends containing longitudinal slots therein and being overlapped in such a manner that the longitudinal slots are in adjustable alignment and secured together in a fixed relationship by fastening means extending through the slots, said opposing ends terminating in a tray configuration.

4,113,161

COMBINATION CARRYING CASE AND STEP UNIT

Edward J. Manuszak, 1703 College St., South Bend, Ind. 46628

Filed May 31, 1977, Ser. No. 801,730

Int. Cl.[2] B65D 71/00

U.S. Cl. 224—46 R **2 Claims**

1. An article of manufacture comprising an article carrying case having side panels and water resistant top and bottom panels and of rigid construction to support the weight of a person standing thereon, said top panel also having a tread surface to prevent inadvertant slipping of said person when standing on said top panel, said top panel being pivoted to a side panel and releasably locked in operating position, a hand grip mounted on a side panel, and an extensible member adjustably carried by said grip-mounted side panel and having an extended position accommodating grasping thereof by said person while standing on said carrying case and descending or ascending from and climbing to a level above the top of the case and a second retracted position accommodating convenient transport of said carrying case from place to place, wherein said extensible member is an elongated flexible strap having means anchoring the ends thereof to said grip mounting side panel, at least one of said end anchoring means being releasable from said grip-mounted side panel, and the released end of said strap being grasped during said descending or ascending of said person so that said case may be retrieved when said person is no longer standing on said case.

4,113,162

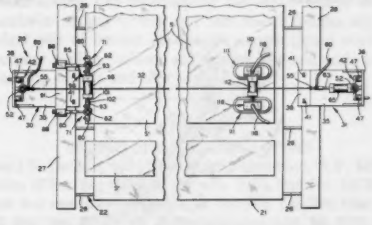
METHOD OF AND APPARATUS FOR THERMALLY SEVERING GLASS

Hans W. Boehm, Toledo; Richard A. Herrington, Walbridge, and Waldemar W. Oelke, Rossford, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Feb. 9, 1977, Ser. No. 767,051

Int. Cl.[2] B26F 3/00, 3/12

U.S. Cl. 225—2 **17 Claims**



1. A method of cutting glass along a desired line of cut comprising: scoring one edge of a glass sheet, applying concentrated heat against one surface of said glass sheet along a narrow line coincident with a desired line of cut in registry with the score mark on said edge causing said sheet to split progressively from said scored edge in a running cut along said line,

and physically spreading the severed portions on the opposite sides of said line apart as said running cut advances along said desired line of cut.

4,113,163

FASTENING TOOL USING CASELESS MUNITION

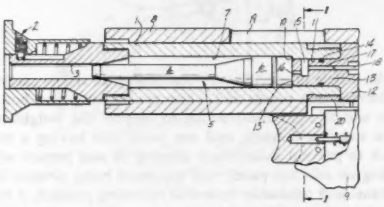
Marc Combette, 116, rue des Moulins, 26000 Valence; Roger Dorgnon, Avenue de St-Romain de Lerps, 07130 St Peray; Jean Luthringer, 16, Avenue Vion Whitcomb, 75016 Paris, and Jean Ollivier, 80, Avenue de Beaumes, 26000 Valence, all of France

Continuation-in-part of Ser. No. 723,831, Sep. 16, 1976, which is a continuation of Ser. No. 628,628, Nov. 4, 1976, abandoned.

This application Jun. 13, 1977, Ser. No. 805,663

Int. Cl.[2] B25C *1/14*

U.S. Cl. 227—10 **10 Claims**



1. A powder-actuated tool of the type utilizing caseless munition, said tool including a housing, a breech in said housing, a barrel assembly mounted in said housing and having relative axial movement with respect to said breech between a forward and rearward position, said breech including an elongated portion extending toward said barrel, a caseless munition receiving chamber in said elongated portion, said receiving chamber including forward and rearward chamber walls and a munition loading opening in an axially extending surface of said elongated portion, closing means for overlying said opening to close the latter when the tool is in condition for firing, a low pressure chamber in said barrel assembly, and passageway means in said elongated portion providing communication between said chamber and said low pressure chamber.

4,113,164

STAPLER

Gustav Muthenthaller, Milan, Italy, assignor to Kores S.p.A., Milan, Italy

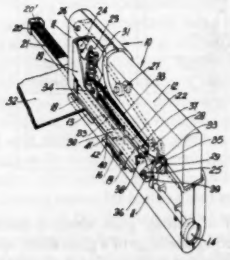
Continuation of Ser. No. 718,041, Aug. 26, 1976, abandoned.

This application Aug. 12, 1977, Ser. No. 823,963

Claims priority, application Italy, Mar. 4, 1976, 20856 A/76

Int. Cl.[2] B25C *5/02*

U.S. Cl. 227—124 **4 Claims**



1. A portable office stapler, comprising:

(a) a generally hollow main body having a front slot for receiving sheets to be stapled together and an opening above said slot,

(b) a movable hammer above said slot,

(c) an anvil below said slot,

(d) a staple magazine slidably mounted within said body between an inner stapling position and an outer loading position wherein the forward end of said magazine extends through said opening beyond said body, said magazine having a stop at its forward end and a tooth at its rearward end,

(e) a staple pusher slidably mounted in said magazine,

(f) a lever rotatably mounted within said body and including a hook for engaging said tooth,

(g) means for biasing said pressure plate toward said stop for maintaining staples placed in said magazine against said stop and for urging said magazine toward said loading position, said biasing means also being secured to said lever for urging said hook into engagement with said tooth for maintaining said magazine in said stapling position, and

(h) a button slidably mounted on said body for engagement with said lever so that said button is biased by said biasing means acting through said lever toward a non-operative position and wherein movement of said button by an external force causes said lever to rotate against said biasing means for pulling said hook out of engagement with said tooth and thereby allowing the forward end of said magazine to be projected outside of said body by said biasing means.

4,113,165

SOLDERING APPARATUS

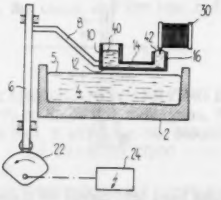
Hans Ott, Adliswil, Switzerland, assignor to Meteor AG, Ruschlikon, Switzerland

Filed Sep. 20, 1977, Ser. No. 835,032

Claims priority, application Switzerland, Oct. 7, 1976, 12678/76

Int. Cl.[2] B23K *3/06*

U.S. Cl. 228—36 **3 Claims**



1. Soldering apparatus comprising a vessel for containing a molten soldering material, a ladle including a tank and a scoop, said ladle being movable into and out of said vessel so as to fill said tank and scoop with soldering material contained in said vessel, said tank and scoop portion being in fluid communication and each having a lip with the lip of said scoop lying in a horizontal plane that is spaced vertically above the lip of said tank.

4,113,166

METHOD OF AND APPARATUS FOR CONVERTING MOLTEN METAL INTO SOLIDIFIED PRODUCTS

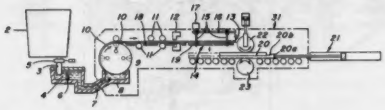
Erik A. Olsson, Rotfluhstrasse 15, 8702 Zollikon, ZH, Switzerland

Continuation-in-part of Ser. No. 537,561, Dec. 30, 1974, Pat. No. 3,971,123, which is a continuation of Ser. No. 337,931, Mar. 5, 1973, abandoned. This application Jun. 28, 1976, Ser. No. 700,080

The portion of the term of this patent subsequent to Jul. 27, 1993, has been disclaimed.

Int. Cl.[2] B23K *19/00*; B21C *37/04*

U.S. Cl. 228—170 27 Claims



1. The method of converting molten metal into semifinished products for subsequent conversion into finished products, wherein:

(a) molten metal from a common heat substantially free of slag is congealed on a single casting unit with a moving chill surface on which the molten metal congeals and discharging the casting so formed from the unit as a plurality of non-laminated thin sections;

(b) transporting the sections as formed to an assembly unit where they are assembled into bodies of predetermined thickness with one section in face-to-face relation with another and with each section at a temperature where it will pressure weld to the contacting surface of another; and

(c) effecting pressure welding of the bodies so assembled and discharging them when the entire assembly has been integrated by welding.

4,113,167

EXHAUST SYSTEM MEANS FOR AUTOMOBILES

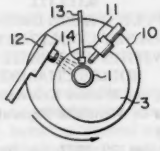
Yoshiro Komiyama, Okazaki; Katsumi Kondo, Toyota; Mototsugu Koyama, Toyota; Masaaki Nagaoka, Toyota, and Tsuneo Uchida, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 25, 1977, Ser. No. 781,408

Claims priority, application Japan, Nov. 16, 1976, 51-137988

Int. Cl.[2] B23K *31/02, 28/00*

U.S. Cl. 228—176 2 Claims



1. In a method of producing an exhaust system for automobiles which comprises at least two members joined together by welding along an arcuate or circular joining portion having a relatively small radius of curvature, said members each being made of a steel material having an anti-corrosive surface layer, wherein the improvement comprises the processes of rotating a preassembly of at least said two members around the center of curvature of said arcuate or circular joining portion, welding said two members together along said joining portion by employing a stationary welder so as to form a weld seam along said joining portion as said preassembly rotates, and spraying a molten metal onto said weld seam just after it has been formed and while it is still hot by employing a stationary molten metal sprayer located adjacent to said welder at its rearward position as seen in the moving direction of said weld seam, and preventing the turbulence of air caused by the molten metal spraying from affecting the welding process by placing a wind screen between said welder and said molten metal sprayer.

4,113,168

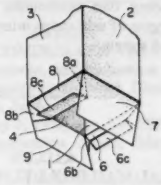
BOTTOM STRUCTURE OF CARDBOARD TYPE LIQUID PACKING CONTAINER

Kiyoshi Shirakawa, Tokorozawa, Japan, assignor to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 707,539, Jul. 22, 1976. This application Jun. 6, 1977, Ser. No. 803,932

Int. Cl.[2] B65D *5/08*

U.S. Cl. 229—37 R 1 Claim



1. In a bottom structure of a cardboard liquid packing container constructed from a laminated cardboard of synthetic resin, said container having four side sheets bonded through side folding lines, the improvement comprising:

four bottom sheets bonded to each other through extensions of said side folding lines, and respectively bonded to said side sheets through bottom folding lines separating said side and said bottom sheets; said bottom sheets including a first pair of opposed rectangular bottom sheets having end portions superimposed upon each other and heat sealed to form a bottom surface, and a second pair of opposed bottom sheets, each having oblique folding lines extending at an angle of 45° from apexes formed by the intersection of said extended side folding lines and said bottom folding lines, said oblique folding line defining a pair of triangular corner sealing surfaces, a trapezoidal exterior sealing surface between said triangular corner sealing surfaces, and a rectangular sealing flap adjacent said corner and said exterior sealing surfaces, said triangular corner sealing surfaces folded 180° along said oblique folding lines such that said corner surfaces overlap and contact the end portions of said trapezoidal exterior sealing surface and said sealing flap overlaps and contacts the center portion of said trapezoidal exterior sealing surface between the overlap of said corner sealing surfaces on said exterior sealing surface, said triangular corner sealing surfaces and said sealing flap overlapping the entire length of said exterior sealing surface and heat sealed thereto, and said first pair of bottom sheets also superimposed over said corner sealing surfaces, said sealing flap and said exterior sealing surface and heat sealed thereto.

4,113,169

SERIES FILLED CONTAINERS

Richard S. Carlisle, 1051 Broadway, Thornwood, N.Y. 10594

Division of Ser. No. 427,433, Dec. 21, 1973, Pat. No. 3,975,885, which is a continuation-in-part of Ser. No. 231,288, Mar. 21, 1972, Pat. No. 3,815,794. This application Aug. 16, 1976, Ser. No. 714,746

Int. Cl.[2] B65D *27/10*

U.S. Cl. 229—53 5 Claims

1. An interconnected strip of pouches, comprising a pair of mutually opposed thermoplastic strips joined together by seams defining two series of pouches each having an open-

ended spout extending from a body with the spouts of one series of pouches directed toward one margin of the opposed pair of strips and with the spouts of the other series of pouches directed toward the opposite margin of said strips, the width of the body as measured along the strip generally being much

larger than the width of the spout as measured along the strip, the bodies of each series of pouches being adjacent spouts of the other series of pouches, and said interconnected strip of pouches including two continuous stip portions along the respective margins of said strips interconnecting the open end portions of said spouts.

4,113,170

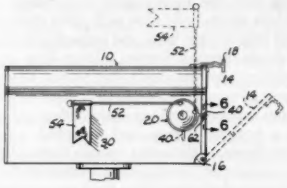
RURAL MAILBOX DELIVERY SIGNAL

Monroe T. Hunsicker, Rte. 1, Earlsboro, Okla. 74840

Filed Jul. 25, 1977, Ser. No. 819,013

Int. Cl.[2] A47G *29/12*

U.S. Cl. 232—35 **2 Claims**



1. A door controlled signal device for a rural mailbox having a side wall and having an entrance opened and closed by a door hingedly mounted for vertical swinging movement, comprising:

a base flatly connected with the outer surface of said side wall

at its end portion adjacent the entrance,

said base having a horizontally disposed hub;

a dome-shaped cover overlying said base,

said cover having a stub axle journalled by said hub for rotation of said cover with respect to said base;

a latch arm radially secured to the periphery of said cover;

a cover finger secured to the concave surface of said cover between said stub axle and said latch arm and projecting toward said base in parallel relation with respect to said stub axle;

a base finger secured to said base and projecting toward said cover in parallel spaced relation between said hub and said cover finger;

a signal flag supporting rod secured to and projecting beyond said cover with its axis disposed in off-set parallel relation with respect to the axis of said latch arm;

cam means including a pin secured to said door and underlying said latch arm for maintaining said cover in a first signal idle position; and,

a spring means surrounding said hub and having parallel end portions disposed on respective diametrically opposite sides of said cover finger and said base finger for biasing said cover toward a second signal activated position.

4,113,171

VALVE ARRANGEMENT FOR LIMITING TORQUE OF A HYDRAULIC MOTOR OF A CENTRIFUGE

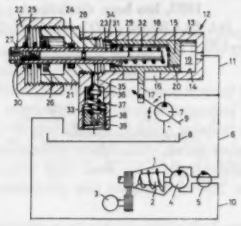
Ivan Jaroslav Cyphelly, Neuhaus, Hinteregg, Switzerland (8128)

Filed Apr. 12, 1977, Ser. No. 786,844

Claims priority, application Switzerland, Apr. 14, 1976, 4777/76; Mar. 21, 1977, 3516/77

Int. Cl.[2] B04B *1/20, 9/10*

U.S. Cl. 233—7 **17 Claims**



1. A valve arrangement for limiting the torque of a hydraulic motor of a centrifuge by adjusting the flow of a pressure medium supplied by a pressure source, wherein said hydraulic motor includes a housing and a shaft and said centrifuge includes a drum, driven by a main drive motor and a worm mounted inside said drum, and further wherein said hydraulic motor housing is firmly connected to said centrifuge drum and said hydraulic motor shaft is firmly connected with said centrifuge worm, in order to produce a slip speed between said drum and said worm, said valve arrangement being arranged to adjust the delivered flow of pressure medium by directly adjusting a pump or by adjusting a flow-measuring throttle element associated with a pressure source, said valve arrangement comprising:

a valve housing;

a spring disposed within and resting against said valve housing;

a pushing element means, mounted in said valve housing against said spring and being exposed to the pressure of the pressure medium, for causing adjustment of the delivered flow of pressure medium; and

adjustable auxiliary valve means for opening an overpressure channel to a part of the pressure medium when a certain threshhold pressure of the pressure medium is reached, in such manner that the flow of pressure medium which is delivered increases abruptly.

4,113,172

CENTRIFUGE WHOSE DRUM CASING IS CONTINUOUSLY COOLED BY A COOLANT CIRCULATED WITHIN AN INSERT DISPOSED IN THE SOLIDS CHAMBER

Gunthard Pautsch, and Werner Kohlstette, both of Oelde, Germany, assignors to Westfalia Separator Aktiengesellschaft, Oelde, Germany

Filed Jun. 29, 1977, Ser. No. 811,421

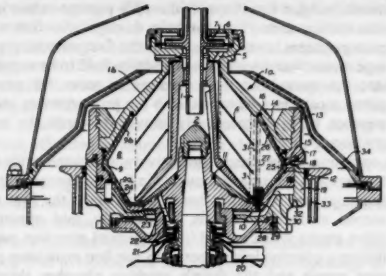
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631110

Int. Cl.[2] B04B *15/02*

U.S. Cl. 233—11 **6 Claims**

1. Centrifuge comprising a rotatable drum having an outer casing, a solids chamber within the outer casing, a conical insert comprising an upper portion and a lower portion mounted in the drum and lining the wall of the outer casing within the drum, means defining a helical passageway for each the upper and lower portions of the insert, said passageways being for passage of heat exchange fluid between the insert and the wall of the outer casing within the drum, for indirect heat exchange with solids disposed in the solids chamber, the conical insert and the outer casing having aligned solids removal

apertures at spaced intervals about the peripheries thereof, a rib joining together the upper and lower insert portions, and a passageway in the rib, communicating the said helical passageways in the upper and lower insert portions for transfer of the



heat exchange fluid from one to the other of the upper and lower insert portions, and means for introducing and withdrawing the heat exchange fluid into and from the helical passageways.

4,113,173

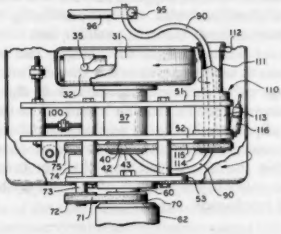
CENTRIFUGAL LIQUID PROCESSING APPARATUS

Houshang Loiachi, Rockville, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 562,748, Mar. 27, 1975, abandoned. This application Feb. 11, 1976, Ser. No. 657,187

Int. Cl.[2] B04B *5/02, 9/00*

U.S. Cl. 233—25 **8 Claims**



1. Apparatus for use in conjunction with a flexible communication conduit for maintaining communication with terminal means under centrifugation, comprising, in combination:

a stationary base;

a rotor drive assembly rotatably mounted to said base for rotation along a predetermined axis;

a rotor assembly, including terminal means, said rotor assembly being rotatably mounted to said rotor drive assembly for rotation with respect thereto along said axis by means including a support shaft journaled to said drive assembly, said support shaft including a central axially-extending aperture;

a rotor drive pulley locked for rotation with said rotor assembly;

support means for supporting said communication conduit above said rotor assembly along said axis;

guide means including a guide member on said rotor drive assembly for guiding the communication conduit from said support means through said axially-extending aperture to said terminal means, said guide means rotatably coupling said conduit to said rotor drive assembly with respect to said axis;

said rotor drive assembly being rotatably mounted to said base by means of a support shaft axially-aligned with said axis of rotation;

drive means for rotating said rotor assembly and said rotor drive assembly in like directions with a speed ratio of 2:1 to maintain communication without completely twisting said conduit, said drive means including a stationary pulley carried by said base, planetary drive means carried on said rotor drive assembly and coupled to said stationary pulley and said rotor drive pulley for driving said rotor assembly, said planetary drive means including a drive belt operatively engaged at one end to said stationary pulley and at its other end to said rotor drive pulley, and belt guide means comprising a pair of guide pulleys rotatably mounted on said rotor drive assembly for causing said drive belt to orbit with said rotor drive assembly about said predetermined axis of rotation.

4,113,174

TEMPERATURE CONTROLLED VALVE ASSEMBLY

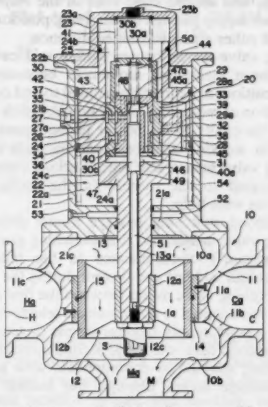
Yasuo Kagiyama, Toyonaka, and Nobumasa Miyazaki, Mino, both of Japan, assignors to Daihatsu Diesel Manufacturing Co., Ltd., Toyonaka, Japan

Filed May 3, 1977, Ser. No. 793,359

Claims priority, application Japan, May 17, 1976, 51-62945[U]

Int. Cl.[2] G05D *23/12, 11/16*

U.S. Cl. 236—12 A **12 Claims**



1. A temperature controlled valve assembly which comprises, in combination:

a valve housing structure including first and second housings having first and second compartments defined therein, respectively, said first housing having hot and cold fluid inlet ports for the introduction of hot and cold fluid mediums, respectively, from associated sources thereof into the first compartment and a common outlet port for the discharge of a mixture of the hot and cold fluid mediums to the outside of the first housing, said second housing further having a drive fluid inlet port adapted to be coupled to a source of a drive fluid under pressure and a vent hole for the discharge of the drive fluid to the outside of the second housing;

a proportioning valve means housed within the first compartment for movement between hot and cold positions, said proportioning valve member when moved towards the hot position decreasing the substantial opening of the cold fluid inlet port and correspondingly increasing the substantial opening of the hot fluid inlet port while said proportioning valve member when moved towards the cold position increases the substantial opening of the cold fluid inlet port and correspondingly decreases the substan-

tial opening of the hot fluid inlet port, said proportioning valve member being held in position substantially intermediately between the hot and cold positions when and so long as the fluid mixture attains a predetermined temperature;

a temperature sensor for sensing variation in temperature of the fluid mixture and for generating one at a time first and second mechanical signals indicative of reduction and increase in temperature of the fluid mixture, respectively, with respect to the predetermined temperature of the fluid mixture;

a power piston means connected with said proportioning valve means for movement together therewith and operatively housed within the second compartment, said second compartment being divided into first and second sealed working chambers one on each side of said power piston means, said power piston means having a cavity defined therein;

a relay passage means defined in the power piston means and having one end opening towards the cavity and the other end held in constant communication with the drive fluit inlet port during the movement of the power piston means;

first and second supply passage means defined in the power piston means, said first supply passage means having first and second open ends respectively opening towards the first working chamber and the cavity, said second supply passage means having first and second open ends respectively opening towards the second working chamber and the cavity, said second open ends of the respective first and second supply passage means being positioned spaced from each other a predetermined distance;

a switching valve means housed within said cavity in the power piston means for movement between first and second positions in a direction parallel to and coaxial with the direction of movement of the power piston means and dividing the cavity in the power piston means into third and fourth working chambers one on each side of the switching valve means, said third working chamber being communicated to the outside of the second housing through the vent hole;

first and second switching passage means defined in the switching valve means, said first switching passage means being constantly communicated to the relay passage means through said one end thereof during the movement of the switching valve means between the first and second positions and adapted to communicate selectively with the first and second supply passage means through their respective second open ends, said second switching passage means being adapted to communicate with said second supply passage means through the second open end thereof;

a first biasing means for causing the switching valve means to tend to move towards its second position, said first and second supply passage means being communicated to the first switching passage means and to the third working chamber, respectively, when the switching valve means is held in the second position irrespective of the position of the power piston means;

first and second lands defined on the switching valve means, said first and second lands closing the second open ends of the first and second supply passage means, respectively, when and so long as the fluid mixture attains the predetermined temperature with the switching valve means positioned substantially intermediately between the first and second positions, said first and second lands being spaced from each other a distance equal to the distance between the second open ends of the respective first and second supply passage means;

a first vent passage means communicating between the second switching passage means and the third working chamber, the first working chamber, when the second land opens the second open end of the second supply passage upon movement of the switching valve means towards the first position relative to the power piston means to establish the communication between the second supply passage means and the second switching passage means, being vented through said first vent passage means to the vent hole, the second open end of the first supply passage means being, when the second supply passage means is so communicated to the vent hole through said first vent passage means, communicated to the first switching passage means thereby allowing the drive fluid to be supplied into the second working chamber to move the power piston means in a direction with the proportioning valve member being consequently moved towards the cold position;

an operating valve means operatively associated with the temperature sensor and movable in first and second directions opposed to each other in response to the first and second mechanical signals, respectively, said operating valve means when moved in said second direction establishing a communication between the first switching passage means and the fourth working chamber thereby allowing the drive fluid to be supplied into the fourth working chamber to move the switching valve means towards the first position against the first biasing means with the drive fluid within the first switching passage means being also supplied into the second working chamber through the second supply passage means whereby the power piston means is moved in a direction with the proportioning valve member being moved towards the hot position, said operating valve means when moved in said first direction establishing a communication between the first switching passage means and the first working chamber through the first supply passage means, a communication between the fourth working chamber and the vent hole and a communication between the second working chamber to the vent hole through the second supply passage means whereby the power piston means is moved by the drive fluid, supplied into the first working chamber, in a direction with the proportioning valve member moved towards the cold position; and

a second biasing means for causing the operating valve means to tend to move in the second direction, said operating valve means being moved in the first direction against the second biasing means when the drive fluid is supplied into the fourth working chamber;

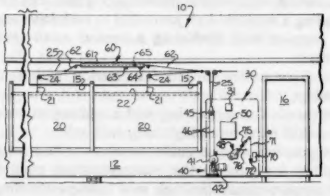
the pressure within the first working chamber and that within the second working chamber being equalized to each other in the absence of any one of the first and second mechanical signal.

4,113,175

VENTILATION SYSTEM FOR POULTRY OR LIVESTOCK HOUSE

James Alton Sutton, Jr., 1545 Shelton Ave., Statesville, N.C. 28677

Filed Aug. 20, 1976, Ser. No. 716,158
Int. Cl.[2] G05D *123/00*
U.S. Cl. 236—46 A **17 Claims**



1. A method of ventilating a confinement house of the type employed for rearing poultry and livestock and wherein there are ventilation openings in the walls of the house with adjust-

able closures for adjusting the effective size of the openings, said method comprising operating an exhaust fan for a relatively short period of time during each of a succession of predetermined intervals of longer duration to periodically draw outside air into the house through the ventilation openings, while sensing a differential in pressure between the inside and outside of the house as a result of operation of the exhaust fan, determining whether a predetermined minimum acceptable pressure differential is achieved during each such interval, and then following each such interval and in response to determining the failure of the exhaust fan in achieving a predetermined minimum acceptable pressure differential during such interval, effecting adjustment of the closures to a more closed position to bring about an increase in the pressure differential and a resulting increase in the velocity of the air drawn into the house to a desired level sufficient for effective ventilation of all areas of the house.

16. In a confinement house of the type employed for rearing poultry and livestock and having ventilation openings in the walls thereof and adjustable closures cooperating with the ventilation openings for adjusting the effective size thereof, the combination therewith of a ventilation system for supplying a controlled flow of fresh air throughout the confinement house, said ventilation system comprising a plurality of exhaust fans operable to establish a pressure differential between the inside and outside of the confinement house for drawing a flow of outside air into the house through the ventilation openings, timer means cooperating with certain of said exhaust fans for effecting cyclical operation thereof in regular cycles and for relatively short duration during predetermined normal temperature conditions in the confinement house to supply the minimum ventilation requirements for the house, thermostat means cooperating with at least certain other of the fans for effecting operation thereof during predetermined elevated temperature conditions in the confinement house for thereby supplying increased levels of ventilation in the house when needed, drive means connected to the adjustable closures for adjustably positioning the same, and closure control means for controlling the positioning of the adjustable closures by said drive means so as to maintain the velocity of the air drawn into the confinement house through the ventilation openings at an optimum level for effective ventilation of all areas of the house regardless of the number of exhaust fans in operation at a particular time, said closure control means including minimum condition responsive means for sensing the occurrence of a predetermined minimum acceptable differential in pressure between the inside and outside of the confinement house, and means associated with said minimum condition responsive means and operable in response to the failure of said predetermined minimum acceptable pressure differential being achieved as a result of operation of one or more of said exhaust fans for effecting adjustment of the closures to a more closed position to thereby bring about an increase in the pressure differential and a resulting increase in the air velocity drawn into the house through the ventilation openings.

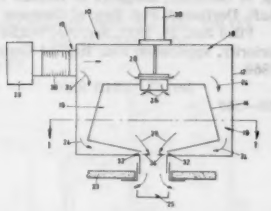
4,113,176

AIR-CONDITIONING

Nicholas Caknis, 24, Farmers Folly, Lynnwood, Pretoria, South Africa

Filed Apr. 21, 1976, Ser. No. 678,742
Int. Cl.[2] F24F *7/00*
U.S. Cl. 236—49 **8 Claims**

1. An air discharge terminal unit comprising a housing with an air inlet and an air outlet, means between the inlet and the outlet for dividing an air flow through the housing into primary and secondary air streams, means for directing a pair of opposing jets of primary air onto the secondary air stream, and means for directing jets of air onto opposing jets of primary air comprising first conduit means having openings positioned to direct air jets into the negative pressure zones on corresponding sides of the primary air jets and second conduit means



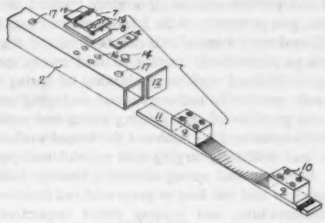
having openings positioned to direct air into the negative pressure zones on the opposite sides of the primary air jets.

4,113,177

COMPOSITE RAILROAD CROSS TIE WITH RAIL SUPPORT BLOCKS

Walter Collins, 9543 Achates Cir., and Howard Blankumsee, 9324 Quesada Way, both of Sacramento, Calif. 95826

Filed Apr. 8, 1977, Ser. No. 785,834
Int. Cl.[2] E01B *3/18*
U.S. Cl. 238—72 **4 Claims**

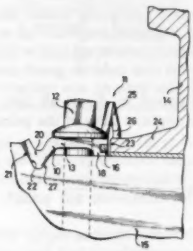


1. A railroad cross tie comprising a hollow box member of rectangular configuration, block members positioned within the hollow of said box member provided with means to fixedly constrain their position in said box member, rail members overlying said block members disposed exteriorly of said box member and transverse thereto having means to fasten said rail members to said block members, and having means to insulate and damp said rail members from said box member, whereby said means to fixedly constrain includes a board member which is attached to said block members along their bottom surface, and end plates which are fastened to the openings of said hollow box member, and said means to fixedly constrain further includes sand injected within said hollow box member through a hole having a plug element and said means to fasten said rail members to said block members includes at least one bushing disposed within said block members having a knurled outer surface and threaded inner surface, an opening in said hollow box member in registry with said bushing, a support plate overlying said box having an opening which registers with said opening in said hollow box, a rail which overlies said support plate but does not extend over said support plate hole, collar means overlying a portion of said rail having a hole therein in registry with said support plate's hole, and bolt means threadedly fastened to said bushing while extending through said collar, support plate, and box member.

4,113,178
RESILIENT RAIL CONNECTION

Horst E. Steinfeld, Villigst, and Dieter Mathes, Hagen, both of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Jan. 25, 1977, Ser. No. 762,347
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1976, 2602869
Int. Cl.[2] E01B 9/30
U.S. Cl. 238—349 6 Claims



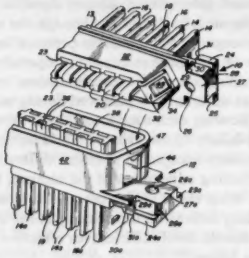
1. In combination with a rail having a rail foot: a rail understructure supporting said rail and having recess means respectively arranged on opposite sides of said rail foot in spaced substantially parallel relationship adjacent thereto, each of said recess means being provided with at least one surface inclined to the longitudinal central plane of said rail, a plurality of guiding plates respectively associated with said recess means, each of said guiding plates having an upwardly opening angular first end portion and an oppositely located second end portion in close proximity to the lateral surface of said rail foot to limit lateral movement of said rail, each of said angular first end portions respectively resting in said recess means and engaging an inclined surface, a plurality of spring elements respectively constantly under pre-load engaging under said second end portions of said guiding plates and confined between said second end portions and the lateral surfaces of said rail foot and resiliently urging said second end portions in upward direction, said spring elements having resilient ends extending over said rail foot to press said rail downwardly on said understructure, said guiding plates respectively being provided with oblong passages, and adjustable connecting bolts respectively extending through said passages and against the thrust of said spring means holding said guiding plates in firm connection with said understructure.

4,113,179
CONNECTOR CONSTRUCTIONS AND ATTACHING MEANS THEREFOR

William H. McKee, West Covina, Calif., assignor to TRW Inc., Elk Grove Village, Ill.

Filed Oct. 29, 1976, Ser. No. 736,942
Int. Cl.[2] H01R 13/54
U.S. Cl. 339—91 R 37 Claims

1. In a ribbon connector construction the combination comprising a body of electrically insulating plastic; a plurality of wire engaging contacts mounted thereon; each of said contacts having a wire termination portion for engaging a wire in electrical contact and a mating portion for engaging a contact mating portion of another connector in electrical contact; resilient latch means of substantially J-shaped configuration having a proximal longer arm anchored to said connector body and extending therefrom in a direction generally parallel to said mating portion of said contacts; said latch means having a shorter distal arm defining a detent and integrally formed with said proximal arm; said latch means detent being arranged on an outwardly disposed face of said distal arm and facing generally toward said connector body; said longer arm and shorter arm being resiliently movable relative to said connector body

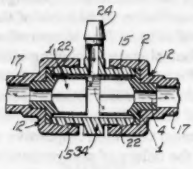


for resilient snap engagement with an element to which said connector is to be attached.

4,113,180
FLUSH-DRIP IRRIGATION EMITTER

Mark H. Christy, 1750 S. Zeyn St., Anaheim, Calif. 92802, and Lloyd Spencer, 220 Patrician Way, Pasadena, Calif. 91105

Filed Jul. 23, 1976, Ser. No. 708,062
Int. Cl.[2] B05B 1/32
U.S. Cl. 239—109 3 Claims



1. A flush-drip irrigation emitter element, comprising:
a. a mounting base having an outlet bore;
b. opposed, normally arched walls defining a flush passage therebetween essentially lens shaped in cross section and discharging into the mounting outlet bore the walls having lateral edges separated by slits;
c. one of the walls having at least one longitudinally extending drip channel disposed between the lateral edges of the flush passage;
d. the walls being formed of highly flexible elastomeric material and, when subject to a predetermined low pressure differential during initial flush flow, are caused to move into essentially flat mutual sealing contact throughout an area extending to the lateral edges and extending a predetermined distance axially, thereby to limit flow solely to the area of the drip channel, the lateral slits offering no resistance to closure of the walls into mutual sealing contact to minimize the pressure required to effect drip flow.

4,113,181
HIGH RISE SPRINKLERS

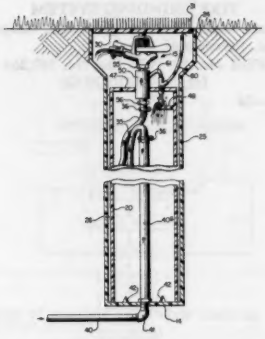
Kerney T. Sheets, P.O. Box 637, Duplessis, La. 70728

Continuation-in-part of Ser. No. 603,457, Aug. 11, 1975, Pat. No. 4,014,502, which is a division of Ser. No. 439,323, Feb. 4, 1974, abandoned. This application Jan. 12, 1977, Ser. No. 758,648

The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.

Int. Cl.[2] B05B *15/10*

U.S. Cl. 239—206 16 Claims



1. A projectable law, farm, and orchard sprinkler comprising:

(a) housing means having a top end means and a bottom end means;

(b) projectable float means located in said housing means;

(c) sprinkler head means connected to said projectable float means for spraying fluids;

(d) means connected to said projectable float means for pumping fluids into the interior of said projectable float means to float said projectable float means upward within said housing means, said pump means including:

(i) first inlet means having a first end and a second end for receiving and conveying a stream of liquids from said liquid supply means to outlet means, said first end being connected to said liquid supply means;

(ii) outlet means for discharging fluids into the interior of said projectable float means, said outlet means being connected to said second end of said first inlet means and in substantial alignment therewith, said outlet means having a first end and a second end;

(iii) second inlet means for conveying air to said stream of liquids; and,

(iiii) jet forming means including a reduced section means located in the downstream end of said first inlet means and substantially adjacent to the intersection of said second inlet means and said stream of liquids for increasing the velocity of said stream of liquids as said stream of liquids exits from said first inlet means into said outlet means; and,

(e) liquid supply means connected to said means for pumping fluids into the interior of said projectable float means and to said sprinkler head means for supplying liquid under pressure to said means for pumping fluids into the interior of said projectable float means and to said sprinkler head means.

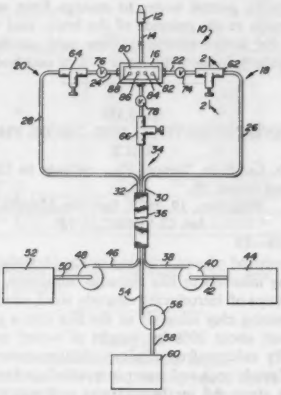
4,113,182
MULTI-FLUID WASH SYSTEM

Reacelyn A. Brago, 1964 E. Oak Rd., Apt. J-6, Vineland, N.J. 08375

Filed Mar. 18, 1977, Ser. No. 779,151

Int. Cl.[2] B05B *7/26*

U.S. Cl. 239—304 5 Claims



1. A spray gun system comprising a spray nozzle in fluid connection with a mixing chamber, a plurality of conduits, each in direct fluid connection with said mixing chamber, a shut-off and metering valve means in each of said conduits, each of said conduits being in fluid connection with a separate corresponding source of fluid, each conduit having a separate corresponding pump operatively connected between it and its corresponding source of fluid, said conduits being separated from each other and interconnected only by said mixing chamber, and individual control means on said mixing chamber for individually passing fluids from each of said sources of fluid through the corresponding conduits into said mixing chamber, said spray nozzle being directly connected to said mixing chamber and extending therefrom.

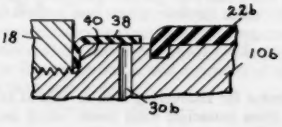
4,113,183
NOZZLE FOR ROTARY FILTER PIPE

Fred E. Stuart, Sr., 1157 Bel Aire Dr., Daytona Beach, Fla. 32020

Filed Oct. 28, 1976, Ser. No. 736,475

Int. Cl.[2] B05B *1/32*

U.S. Cl. 239—533.13 5 Claims



1. In a nozzle, especially for mounting on the trailing side of a rotary filter pipe through which water is supplied to the nozzle, the water exiting the nozzle providing thrust tending to cause rotation of the pipe; a nozzle body having an inner end adapted for connection to a pipe and also having an outer end from which the water exits, said body also having a central passage extending axially therethrough from inner to outer end, further passage means in said body comprising a plurality of uniformly radially distributed auxiliary passage means each of a smaller cross-sectional area than the cross-sectional area of the central passage outer end and inclined from said central passage outwardly to the surface of said body so that water

may also exit the nozzle body by way of the further passage means in a direction to aid the thrust tending to cause rotation of the pipe, and valve means mounted on said body and normally closing said auxiliary passage means at the surface of said body to normally prevent flow of water through said auxiliary passage means and yieldable in response to the supply of water under pressure to said auxiliary passage means from said central passage to permit water to emerge from said auxiliary passage means to the exterior of the body, said valve means directing the water emerging from said auxiliary passage means angularly toward the outer end of said body.

4,113,184

WET GRINDING METHOD FOR CRUDE PHOSPHATE ROCK

Gregory D. Loughrie, Tampa, Fla., assignor to CF Industries, Inc., Long Grove, Ill.

Filed Sep. 19, 1977, Ser. No. 834,281
Int. Cl.² B02C *23/18*
U.S. Cl. 241—15 **10 Claims**

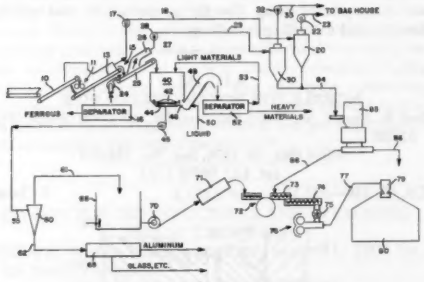
1. The method of wet grinding crude phosphate rock containing clay minerals or like siliceous impurities, which comprises the steps of: introducing coarsely sized, crude phosphate rock containing clay minerals or the like into a grinding mill with at least about 20% by weight of water; introducing a substantially calcium-free alkaline additive material into the mixture of crude rock and water to establish and maintain a pH of at least about 8.5 in the mixture; and wet grinding said mixture to a selected particle size whereby to produce a conveniently processable slurry.

4,113,185

PROCESS FOR PRODUCING FUEL FROM SOLID WASTE

Paul G. Marsh, Hamilton, and Dean H. Kohlhepp, Centerville, both of Ohio, assignors to Black Clawson Fibreclaim, Inc., Middletown, Ohio

Filed Jun. 8, 1977, Ser. No. 804,786
Int. Cl.² B02C *23/38*
U.S. Cl. 241—21 **9 Claims**



1. A process for recovering fuel, as well as other reusable materials, from municipal solid waste which includes paper and other fibrous materials, non-fibrous organic materials, metal, glass and other inorganic materials comprising:

a. dry shredding the waste to pieces of a range of predetermined sizes,

b. separating said shredded refuse by air classification into a light fraction which is predominantly paper and a heavy fraction,

c. treating said heavy fraction to reduce the relatively frangible portions thereof to less than a predetermined particle size by subjecting said heavy fraction in the presence of a liquid to substantial and violent mechanical and hydraulic shear to form a slurry,

d. separating the inorganics in said slurry from the organic material therein,

e. dewatering said organic material to a particulate mass, and

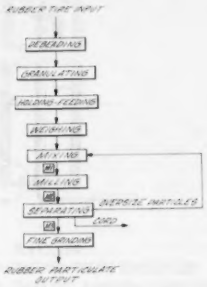
f. combining said particulate mass with said light fraction for use as fuel.

4,113,186

TIRE GRINDING SYSTEM

George William Smith, Woodbridge, Conn., assignor to USM Corporation, Farmington, Conn.

Filed Jan. 18, 1977, Ser. No. 760,264
Int. Cl.² B02C *23/00*
U.S. Cl. 241—24 **1 Claim**



1. A process for treating rubber tires to break them down to a reduced size comprising:

debeading the inside rims of the tires;

transferring the tires to a granulator;

granulating the tires into chunks of tires of about 2.5 cm. in breadth;

transferring the chunks of tires to a holding unit and feeder arrangement;

feeding said chunks of tires to a weight unit;

weighing said chunks of tires to reach a predetermined quantity of from about 100 to about 500 pounds;

transferring said predetermined quantity of chunks of tires to a high intensity mixing machine;

grinding said chunks of tires in said high intensity mixing machine into smaller tire particles of about a 30 mesh size;

separating magnetically any metal from the 30 mesh size particles;

transferring said smaller tire particles into a hammer mill;

beating said smaller tire particles in said hammer mill, loosening the rubber portions and cord portions of said particles from one another;

transferring said loosened rubber portions and cord portions of said particles to a separating machine;

separating magnetically any metal a second time from the loosened tire portions;

separating small rubber particles from cord particles through several layers of vibrating screens;

directing any oversize tire particles back to said mixing machine;

transferring said small rubber particles to a grinder;

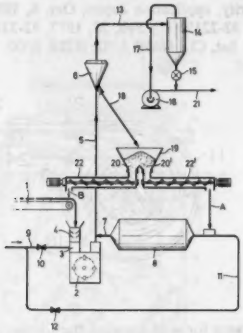
separating magnetically any metal a third time from the small rubber particles; and

grinding said small rubber particles into a fine grind rubber product of up to about a 100 mesh size.

4,113,187
METHOD AND APPARATUS FOR DRYING AND GRINDING

Heinz Hoppen, Overath-Steinenbrück, and Heinz Fasbender, Krefeld, both of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Apr. 14, 1977, Ser. No. 787,598
Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620461
Int. Cl.[2] B02C *23/12*
U.S. Cl. 241—24 8 Claims



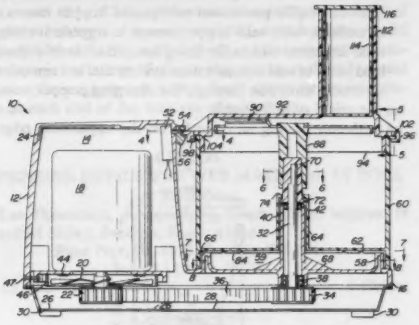
1. A method of grinding particulate material which comprises:
introducing the material to be ground into a coarse grinding device,
delivering the ground product from said coarse grinding device into a sifter and separating coarse residue from the ground product,
delivering the coarse residue from the sifter to a metering device,
selectively passing metered fractions of the coarse residue from said metering device into said coarse grinding device and into a fine grinding device,
and selectively metering the coarse residue from said metering device to said coarse grinding device and said fine grinding device selectively and substantially proportionately in accordance with loads in said grinding devices and thereby maintaining efficient load and grinding capacity relationship in said grinding devices.

4,113,188
FOOD PROCESSOR

Irving R. Belinkoff, Queens Village, N.Y., assignor to Kidde Consumer Durables Corp., Bala Cynwyd, Pa.

Filed Apr. 25, 1977, Ser. No. 790,509
Int. Cl.[2] B02C *18/12*
U.S. Cl. 241—37.5 11 Claims

1. A food processor comprising an open bottom housing having an integral platform projecting generally horizontally from a lower end thereof, an electrical motor supported upright in said housing, the upper end of said motor being above the elevation of said platform, an upright drive spindle supported by said platform and projecting thereabove, drive means interconnecting said motor with said spindle, a bowl removably supported on said platform alongside the portion of the housing containing said motor, said bowl having a centrally located upstanding boss on a bottom wall thereof, said spindle extending through said boss, cooperating members on said bowl and platform for registering said bowl in a predetermined locked position relative to said housing, a cover removably attached to said bowl, a motor control switch on said motor housing adjacent the elevation of said cover, and an

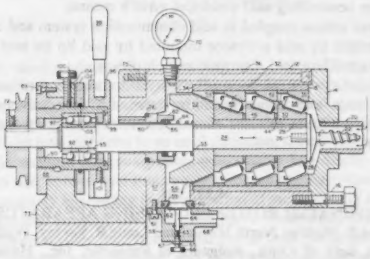


actuator extending radially outwardly from said cover for actuating said switch.

4,113,189
ROLLER-COLLOID MILL

Thomas A. Sullivan, 54 Felt St., Salem, Mass. 01970

Filed May 4, 1977, Ser. No. 793,733
Int. Cl.[2] B02C *23/38*
U.S. Cl. 241—43 9 Claims



1. In a colloid mill having a housing enclosing a rotor and a stator for the treatment of a slurry containing solid particles, the combination with said rotor and stator of at least a roller bearing assembly disposed in said housing, said roller bearing assembly including a generally conical inner raceway and a generally cup-shaped outer raceway and a plurality of rollers disposed between said inner raceway and said outer raceway, and means for feeding said slurry into said roller bearing assembly between said rollers and said inner and outer raceways, said slurry passing from said roller bearing assembly to said rotor and stator for completion of said treatment of said slurry and discharge from said housing.

4,113,190
DEVICE FOR SHAVING ICE

Israel Fudman, 6300 Red Cedar Pl., Baltimore, Md. 21209

Continuation-in-part of Ser. No. 688,372, May 20, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,448
Int. Cl.[2] B02C *18/12*
U.S. Cl. 241—92 12 Claims

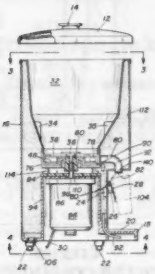
1. A device for producing shaved ice having a range of ice textures from very fine to very coarse and comprising:
a hopper means for holding a supply of random size chunks of ice;
an agitator means positioned below said hopper means to agitate said chunks of ice in said hopper means;
a comminution system containing a range of preadjusted ice

shaving components to produce said range of ice textures, said comminution system being coupled to said agitation means;

at least one baffle positioned within said hopper means and monolithic with said hopper means to impede turning of total ice mass, said baffle being located clear of disassembled parts of said comminution system that are removed in a vertical direction through the charging hopper;

an electrical switch means;

an activator having an open lip on the uppermost edge of



said activator, a bar attached to the outside of said device for producing said shaved ice, said open lip passing over and behind said bar and thereby mounting said activator for controlling said electrical switch means;

power means coupled to said comminution system and controlled by said activator mounted by said lip on said bar controlling said electrical switch means;

a delivery system located adjacent to said comminution system and communicating therewith for delivery of shaved ice to exterior of said device for producing shaved ice.

4,113,191

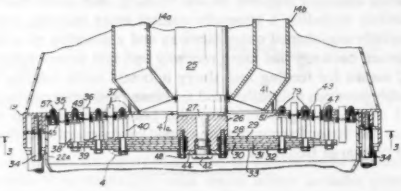
LAMINATED ROTOR PROCESSING APPARATUS

Gurdon B. Wattles, North Haven, and Louis R. Vecsey, Wallingford, both of Conn., assignors to Entoleter, Inc., Hamden, Conn.

Filed Mar. 17, 1977, Ser. No. 778,363

Int. Cl.[2] B02C *13/10*

U.S. Cl. 241—188 A **18 Claims**



1. Rotary processing apparatus comprising, in combination:

(a) a rotor housing,

(b) a rotary spindle adapted to be driven by a power source and having one end thereof passing through an aperture in said housing.

(c) a fabricated rotor in said housing attached to said spindle, said rotor comprising a first purality of processing members attached to at least three substantially flat, generally centrally apertured members arranged in a stack with said apertures being aligned, said spindle being mounted to pass through a predetermined number of said apertures, said flat members being substantially in contact with one another from the region where the rotor is attached to said spindle and extending radially outward therefrom, and

(d) means mounted on said spindle for retaining said stack on said spindle in releasable securement.

4,113,192

APPARATUS FOR WITHDRAWING THE TONGUE OF A FILM INCORPORATED IN A CARTRIDGE

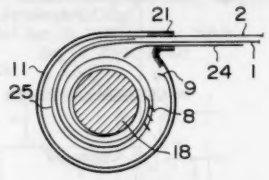
Shinichi Osanai, Ichikawa, Japan, assignor to Labogiken Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1977, Ser. No. 838,059

Claims priority, application Japan, Oct. 4, 1976, 51-119174; Feb. 25, 1977, 52-22194[U]; Feb. 25, 1977, 52-22195[U]

Int. Cl.[2] G03B *1/02*; B25B *9/00*

U.S. Cl. 242—1 **5 Claims**



1. An apparatus for withdrawing the tongue of an exposed film incorporated in a cartridge using a thin resilient film withdrawal strip having hooks formed in the forward portion thereof and adapted to engage the film perforations, a thin resilient guide member having an inwardly curved tip and disposed above said film withdrawal strip, a support plate positioned below said strip to support it and said guide member, means for moving said guide member towards and away from the cartridge to sufficiently insert said guide member into the cartridge through its film withdrawal port and to retract said guide member from said cartridge, means for turning the cartridge spool several times so that the curved tip of said guide member always contacts the outermost portion of the wound film from the outside after said guide member has been inserted in said cartridge, means for moving said film withdrawal strip towards and away from said cartridge to introduce said film withdrawal strip into the cartridge through its film withdrawal port from between said support plate and said guide member inserted in said cartridge and to withdraw said film withdrawal strip so as to withdraw the film from the cartridge by means of engagement between the hooks of said film withdrawal strip and the perforations of the film and, in a case where the film has not been withdrawn, said means for turning said spool being operated to turn the spool again so as to change the position of the film end and said means for moving said film withdrawal strip being operated to repeatedly introduce said film withdrawal strip into the cartridge and to withdraw the film from the cartridge.

4,113,193

METHOD AND APPARATUS FOR WINDING CONICAL COILS OR CHEESES AT CONSTANT THREAD-FEEDING VELOCITY

Hans Raasch, Munchen Gladbach, and Lothar Müller, Kaarst, both of Germany, assignors to W. Schlafhorst & Co., Munchen Gladbach, Germany

Filed Nov. 20, 1975, Ser. No. 633,707

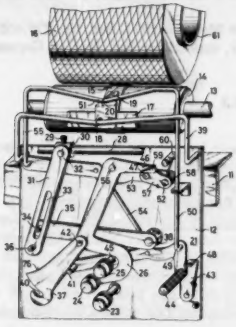
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1974, 2454917

Int. Cl.[2] B65H *54/02*

U.S. Cl. 242—18 R **24 Claims**

1. Method of winding conical cross-wound coils at constant thread-feeding velocity, wherein varying winding speeds between the largest and smallest periphery of the coils are com-

pensated for by filling and emptying a controlled thread storage device, which comprises filling the thread storage device during a time interval wherein the thread is being guided in a three-dimensionally disposed spiral extending from a given neutral periphery of a coil to the smallest periphery thereof and back, and emptying the thread storage device during a time interval wherein the thread is being guided in a three-dimensionally disposed spiral extending from the given neutral periphery of the coil to the largest periphery thereof and back, the instantaneous length of the stored thread being varied in a wave-shaped substantially sinusoidal manner and the amplitude of the respective wave being proportional to the maximal length of the thread to be stored as required during each thread storing operation.



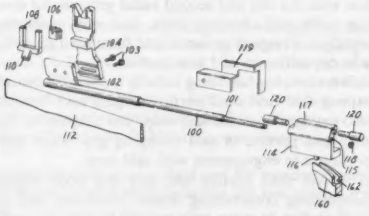
10. In an apparatus for carrying out a method of winding rotary conical cross-wound coils at constant thread-feeding velocity, means for winding a thread onto the coils, means for feeding the thread to said winding means, a thread storage device disposed at respective winding stations of a textile machine and controllably filled with thread and emptied thereof to compensate for varying winding speeds between the largest and smallest periphery of the coils, and a function generator in the form of a rotary control cylinder located at the textile machine and means in engagement with said cylinder cooperatively connected to the thread storage devices of a plurality of the winding stations for controlling the same.

4,113,194

TRAVERSE BAR AND SLIDE

William G. Hensley, Daisy, Tenn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 19, 1976, Ser. No. 743,463
Int. Cl.[2] B65H *54/30, 57/00*
U.S. Cl. 242—43 R **2 Claims**



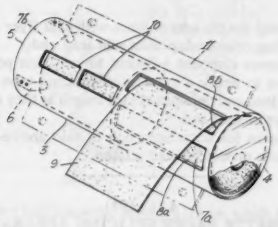
1. In a winding machine for winding yarn packages, having cam-operated means for traversing yarn lengthwise of the yarn package during the winding thereof and a traverse rod and a slider each of plastic material, said slider having a longitudinal hole and bearing a downwardly extending plastic cam roller, said traverse rod having bracket for attachment of thread guide supporting means at one end and distal thereto a reducing shoulder reducing the diameter of said traverse rod to a dimension to fit rotatably and be received in said longitudinal hole of said slider and means retaining said traverse rod rotatably in said slider, the improvement consisting essentially of said slider having an upward integral extension above said longitudinal hole and parallel thereto and a resilient elastomeric bumper of about 50 durometer test in each end of said extension for engagement with a fixed abutment on said machine at each end of the traverse of said slider.

4,113,195

DISPENSING DEVICE FOR WEB MATERIAL IN ROLL FORM

Eos Lee Theunissen, Johannesburg, South Africa, assignor to Manfred Sidley, Sandton, South Africa

Filed Nov. 24, 1976, Ser. No. 744,544
Int. Cl.[2] B65H *19/04*
U.S. Cl. 242—55.3 **6 Claims**



5. A device adapted for dispensing web material from rolls thereof, including a housing defining a tubular bore in which at least one roll may be located, said bore being closed at one end and providing an inlet at its other end whereby a said roll may be moved into said bore in an axial direction, security means at or adjacent said inlet comprising means extending axially relative to said bore of said housing, said means having a diameter progressively narrowing in the direction of movement of a said roll into said housing, the narrowest part of said means being of a diameter smaller than that of said roll at least when substantially charged with material, and two dispensing apertures in the bore wall in side-by-side circumferentially disposed relationship, the apertures being arranged to facilitate maneuvering of the roll in the course of tangentially dispensing material therefrom and for the removal of a spent core of the roll.

4,113,196

MAGNETIC TAPE CARTRIDGE LOADING APPARATUS

George D. Rehklau, Los Altos, Calif., assignor to Electro-Sound, Inc., Sunnyvale, Calif.

Filed Nov. 4, 1976, Ser. No. 738,899
Int. Cl.[2] B65H *19/26, 21/00*
U.S. Cl. 242—56 R **25 Claims**

1. Apparatus for loading tape onto the hub of a spool such as that contained in a magnetic tape cartridge, comprising:

a chassis for supporting the components of said apparatus;

tape supply means for supplying a continuous strip of tape;

carriage means for locating at a first position a spool upon which a predetermined length of said strip is to be wound;

hub drive means disposed proximate said first position and including spindle means for driveably engaging the hub of said spool, and motor means for rotating said spindle means and said hub;

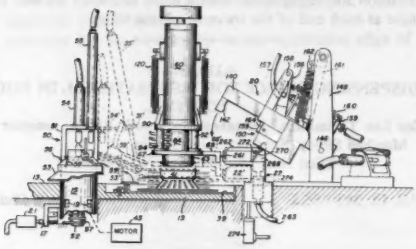
a cutting means disposed adjacent said first position;

flyer means carried by said spindle means for releasably holding the ends of said length of said strip;

tape supply arm means for moving the lead end of said strip

into contact with said flyer means, for guiding said strip as it is wound onto said hub, and for aligning and holding said strip relative to said cutting means as said predetermined length is cut therefrom;

take-up loop arm means for measuring out a selected loop length of the tail portion of said predetermined length, for holding said strip as said predetermined length is cut therefrom by said cutting means, and for moving the tail



end of said length into contact with said flyer means and in abutting relationship with said lead end;

splicing means disposed adjacent to said first position and operative to apply a segment of splicing tape across the abutted lead and tail ends of said length as they are held by said flyer means; and

control means for actuating each of said above-mentioned means in a predetermined sequence.

4,113,197

CIGARETTE PAPER SPLICING APPARATUS

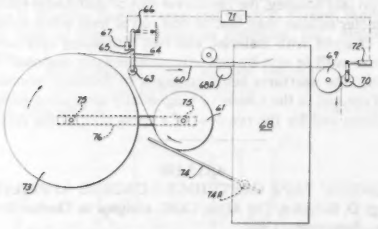
Timothy Cardell Harrington, and Hugh MacDonald Arthur, both of London, England, assignors to Molins Limited, United Kingdom

Filed Nov. 24, 1976, Ser. No. 744,880

Claims priority, application United Kingdom, Dec. 1, 1975, 49266/75

Int. Cl.[2] B65H *19/14, 69/06*

U.S. Cl. 242—58.1 **6 Claims**



1. A web splicing apparatus for joining the trailing end of a web on one reel (especially the paper web used as the cigarette wrapper in a continuous rod cigarette making machine) to the leading end of a web on a stand-by reel, comprising a web splicing device through which the web drawn from the in-use reel is arranged to pass; a movably mounted web guide means supporting both said reels such that both of the webs pass on the same side of said guide with the in-use web nearest to and tensioned around the guide, before reaching the web splicing device; means for urging the web guide towards the in-use web; means for detecting movement of the web guide when tension is lost in the in-use web, indicating that the web is about to expire, and for thereupon initiating operation of the web splicing device to join the in-use web to the stand-by web; and wherein said supporting means includes movable mounting means for supporting each reel so that each reel is movable between a first position which is occupied by the stand-by reel when web splicing is about to take place and a second position which is occupied by the in-use reel when web splicing is about to take place, and means operable after splicing to move the reel that is in use after splicing from the first position to the second position, such movement having the effect of changing the path of the web so that the in-use web engages the guide member and thereby resets the guide member.

4,113,198

REEL FOR COILING STRIP

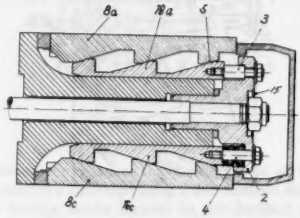
Alexander Rodach, Pforzheim, Fed. Rep. of Germany, assignor to Irma Ungerer Geb. Dollinger, Pforzheim, Fed. Rep. of Germany

Filed Mar. 21, 1977, Ser. No. 779,465

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636662

Int. Cl.[2] B21C *17/10*

U.S. Cl. 242—78.3 **9 Claims**



1. A reel for coiling strip, which comprises

a reel body formed with a stop,

at least three shell portions which are mounted on and are expansible relative to said reel body and comprise at least one first shell portion and at least one second shell portion, said shell portions having radial ribs inwardly projecting from the inner surface of said shell portions, the rib of said first shell portion having an enlarged foot portion, and

expanding and clamping means operable to expand said shell portions relative to said reel body,

said expanding and clamping means comprising a first radially movable clamping bar, which is in engagement with said first shell portion and defines a clamping gap therewith and is also in engagement with said second shell portion at one side of the latter, and a second radially movable clamping bar, which is formed with a recessed bearing surface in slidable engagement with said second shell portion on the side thereof opposite to said first clamping bar,

said reel body formed with first radial grooves for cooperation with the ribs and second radial grooves for cooperation with said clamping bars, said stop projecting inwardly in a respective one of said first radial grooves, that is in opposition to said foot portion,

said first clamping bar being radially outwardly movable to expand said first shell portion, urging said foot portion into engagement with said stop, and adapted to clamp a strip end portion in said clamping gap when said foot portion is in engagement with said stop,

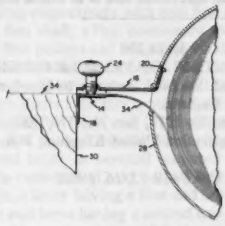
said second shell portion and said reel body comprising cooperating constraining means permitting said second shell portion to move only parallel to said gap, and

said second shell portion being arranged to be expanded relative to said reel body parallel to said gap in response to outward radial movements of said first and second expanding bars and constituting a transition member adapted to support a strip portion adjacent to said strip end portion when the latter is clamped in said gap.

4,113,199
TAPE REEL HOLDER

Angelo Marino, 590 Randolph Rd., Middletown, Conn. 06457

Filed Jun. 10, 1977, Ser. No. 805,587
Int. Cl.[2] B65H 17/52
U.S. Cl. 242—106 6 Claims

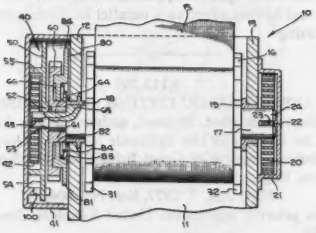


1. A tape reel holder having a body and means for the connection of a tape reel to said body, said body comprising a horizontal surface having one end thereof bent upwardly at an angle to form a lip, a member parallel to and bent under the other end of said horizontal surface, a vertical member bent downwardly from said parallel member, said vertical member located at one end of said body and said lip located at the other end of said body, whereby a tape reel may be hooked onto said lip and a tape may be introduced edgewise between a space formed by said horizontal surface and said parallel member.

4,113,200
SAFETY BELT RETRACTOR WITH CONJUGATE RETURN SPRING MEANS

Akira Tanaka, Northridge, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Jul. 1, 1976, Ser. No. 701,504
Int. Cl.[2] A62B 35/02; B65H 75/48
U.S. Cl. 242—107 5 Claims



1. In a safety belt retractor having a belt storage reel including a reel shaft, first and second biasing means for biasing said reel toward a belt wound condition and means for selectively blocking out the bias of one of said first and second biasing means operable in response to a slight reel rewinding rotation to provide a reduced rewind bias on said reel, the improvement in said means for selectively blocking comprising the provision of:

ratchet means connected to said reel for rotation therewith and having ratchet teeth facing in the reel rewind direction;

pawl means for engaging said ratchet teeth; and

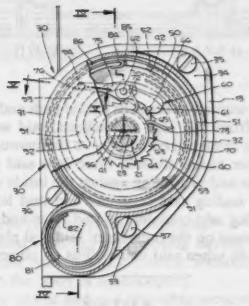
pawl carrier means rotatably mounted on said retractor and mounting said pawl means for movement on said carrier relative to said ratchet teeth between ratchet teeth engaging and non-engaging positions, and wherein

said one of said first and second biasing means comprises a spring having one end connected to said reel shaft and an opposite end connected to said pawl carrier means whereby the bias of said one of said first and second biasing means is blocked when said pawl means is in said ratchet teeth engaging position.

4,113,201
EXTENDED LOW TENSION RANGE DUAL TENSION SAFETY BELT RETRACTOR

Avraham Ziv, Sepulveda, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Filed Apr. 27, 1977, Ser. No. 791,477
Int. Cl.[2] A62B 35/02; B65H 75/48
U.S. Cl. 242—107 12 Claims



1. In a safety belt retractor having a frame, a belt storage reel rotatably mounted to said frame, a rewind spring means for biasing said reel in a belt rewind direction under the urging of a first bias, tension reducing means for providing a second rewind bias on said reel of an amount less than said first bias to provide a reduced tension on said belt, activating means for activating said tension reducing means in response to reel rotation in a predetermined manner, the improvement in means for deactivating said tension reducing means in response to reel rotation under the urging of said second bias comprising the provision of:

spiral cam surface means mounted to said frame and presenting a spiral surface having an extent of more than one full revolution about a spiral center;

cam follower means mounted to said frame for movement along said surface;

means for driving said cam follower means along said surface in direct response to rotation of said reel; and

means operated by radial displacement of said cam follower means relative said spiral center due to travel of more than one full revolution about said center for deactivating said tension reducing means.

4,113,202
AIR-BORNE TRANSPORTATION SYSTEM CONVEYING TRUCK

Eijiro Ueno, Tokyo, Japan, assignor to Ueno Kohgyo Limited, Tokyo, Japan

Filed Apr. 7, 1977, Ser. No. 785,600
Claims priority, application Japan, Dec. 27, 1976, 52-159989
Int. Cl.[2] B65G 51/06
U.S. Cl. 243—33 2 Claims

1. An air-borne transportation vehicle for transporting articles through a transportation tube, said vehicle comprising:

a container within said tube;

a closeable cover on one side of said container;

rotational cylindrical shafts projecting from opposite ends of said container;

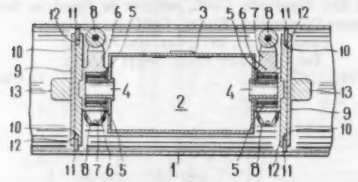
bearings surrounding and movable about each of said shafts;

pads mounted on the circumference of said bearings,

whereby said pads can rotate about said shafts on said bearings;

at least three support legs attached to and equally spaced about each of said pads, said legs extending radially from said pads;

at least one wheel rotatably mounted on each of said legs and in contact with the inside of said tube;



seal plates secured to the ends of said pads and longitudinally spaced from said legs and wheels, said seal plates each having a circumferential groove therearound;

seal member means slidably fitted into said groove in said seal plate and projecting against the inside of said tube for slidably sealing said container and said legs and wheels supporting said container in said tube; and

cushion means on the outsides of said seal plates for absorbing shocks when said vehicle hits an object in said tube.

4,113,203

METHOD AND APPARATUS FOR THRUST VECTOR CONTROL OF SPIN STABILIZED FLYING BODIES BY MEANS OF A SINGLE JET RUDDER

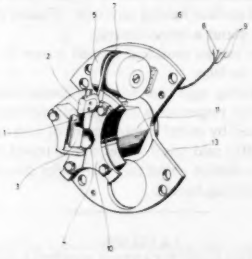
Heinz Kocher, Ottobrunn; Werner Kitzig, and Piet Jozef Witteveen, both of Munich, all of Germany, assignors to Bolkow Gesellschaft mit beschrankter Haftung, Ottobrunn, Germany

Filed Jul. 12, 1966, Ser. No. 566,178

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1965, B 82920

Int. Cl.² F42B *15/00*

U.S. Cl. 244—3.11 **10 Claims**



1. In a method for the control, by a single control force producing device, of a flying body rotating about its rolling axis, and utilizing control signal producing means producing coordinated Cartesian horizontal and vertical control signals and supplied with reference signals produced by the flying body in accordance with its angular position about its rolling axis: the improvement comprising utilizing said reference signals to produce, in said control signal producing means, a sawtooth voltage in which each sawtooth voltage pulse corresponds to a 360° rotation of said flying body; utilizing each sawtooth voltage pulse to produce at least three function potentials spaced from each other by 90°; individually comparing each function potential with said Cartesian control signals to produce a respective pulse width modulating output potential; and combining said pulse width modulating potentials, corresponding to each 360° rotation of said flying body, to produce a control signal potential transmitted to said flying body, and which is phase rigid with respect to the angular position of said flying body about its rolling axis and contains, for the respective 360° rotation of said flying body, control information, for said control force producing device, which is separate for the vertical and horizontal directions and is in timed sequence.

4,113,204

AUXILIARY CONTROL OF VEHICLE DIRECTION

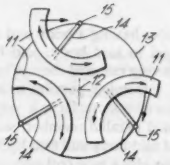
Stanley Leek, Hatfield, England, assignor to Hawker Siddeley Dynamics Limited, England

Filed Feb. 22, 1977, Ser. No. 770,793

Claims priority, application United Kingdom, Feb. 26, 1976, 7596/76

Int. Cl.² F42B *15/16, 19/01*

U.S. Cl. 244—3.21 **9 Claims**



1. An auxiliary aerodynamic or hydrodynamic control surface assembly for a vehicle travelling through a fluid medium, comprising a plurality of retractable arcuate control surfaces each pivotally mounted to be swung in opposite directions from the retracted position so as to protrude at one end or the other from a housing of generally circular cross-section into which they retract; and wherein each control surface is carried on the inner end of an arm that is mounted on a single pivot at or adjacent the circular periphery of the housing, the arm extending from the pivot in a generally inward radial direction of the housing when the control surface is retracted, and the arm pivots being spaced equidistantly around the casing periphery and having pivot axes parallel to the longitudinal axis of the casing.

4,113,205

AERODYNAMIC LIFTING MECHANISMS

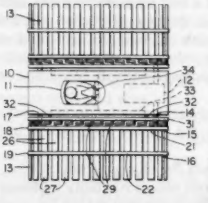
Harry Shaw, Aldershot, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jun. 7, 1977, Ser. No. 804,237

Claims priority, application United Kingdom, Jun. 16, 1976, 24987/76

Int. Cl.² B64C *39/00*

U.S. Cl. 244—20 **1 Claim**



1. An aircraft comprising:

a body with two sides;

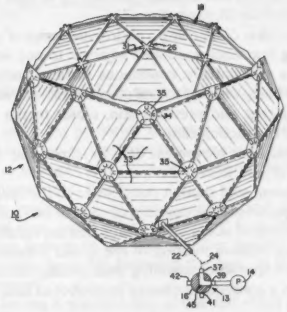
an engine mounted within said body;

means on each side of said body for lifting said aircraft

including: a first shaft extending in a horizontal plane and perpendicular to the direction of flight of said aircraft, rotatably mounted and drivable by said engine; first and second toothed pulleys axially spaced apart on and secured to said first shaft for rotation therewith; a second shaft horizontally spaced apart from and extending parallel to said first shaft; first and second rotatable toothed pulleys mounted on said second shaft in co-planar relationship respectively with said first and second pulleys on said first shaft; a first continuous toothed belt connecting said first pulleys and having a plurality of trunnion eyes; a second continuous toothed belt connecting said second pulleys and having a plurality of trunnion eyes; a plurality of sub-shafts rotatably mounted in said trunnion eyes and extending between said first and second belts; an aerofoil mounted on each of said sub-shafts between said first and second belts; an aerofoil mounted on each of said sub-shafts outboard of said second belt; for each of said sub-shafts, a lever having a first end secured to said sub-shaft, each said lever having a second end; a continuous member movably mounted on said body, said continuous member having a contour which substantially follows the contours of said first and second belts; said second ends of said levers being constrained to follow said contours of said continuous member; and

a control member, operable by a pilot, operatively connected to said continuous members on each side of said body for moving said continuous member relative to said body and hence to said belts and so varying the angles of attack of said aerofoils relative to airflow past said aircraft.

4,113,206
LIGHTER-THAN-AIR APPARATUS AND METHOD OF UTILIZING SAME
David C. Wheeler, 240 Tower Rd., Barrington, Ill. 60010
Filed May 16, 1977, Ser. No. 797,290
Int. Cl.[2] B64B *1/40*
U.S. Cl. 244—31 **10 Claims**



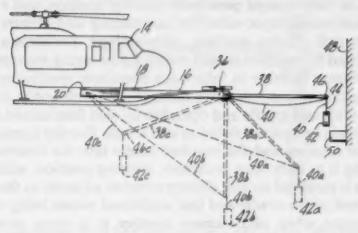
1. Lighter-than-air apparatus, comprising:

a light-weight inner rigid frame of spherelike shape having coarse openings therein, said frame including a plurality of light weight elongated members joined fixedly together at their ends to form a geodesic shape;

a thin, pliable air-tight outer envelope disposed in overlying relationship over said frame, said envelope having a sealable opening therein, said envelope being at least partially evacuated to render said apparatus lighter than air, said envelope including a group of thin flexible high tensile strength sheets disposed in an overlapping side-by-side manner with adjacent ones of said sheets overlapping at their marginal edges, and sealed together at said overlapping marginal edges, each one of said sheets being composed of Mylar film; and

outer frame means disposed within said envelope surrounding and engaging said inner frame for helping support said envelope, said outer frame means being composed of a stiff rigid open mesh material, the coarse openings in said inner frame being larger than the openings in said outer frame means.

4,113,207
AIRBORNE RESCUE DEVICE
David G. Dalziel, 83 E. Laurel Ave., Lake Forest, Ill. 60045
Filed Sep. 14, 1977, Ser. No. 833,170
Int. Cl.[2] B64D *25/02*
U.S. Cl. 244—137 P **9 Claims**



1. An airborne rescue device comprising:

a. an elongated housing; said housing having an elongated slot therein, said housing fixedly secured at one end thereof to the body of a helicopter;

b. a rod, one end of said rod pivotably secured to the other end of said housing;

c. means to selectively position said rod from a storage position within said housing to an extended position wherein said rod is substantially disposed outwardly and parallel to said housing;

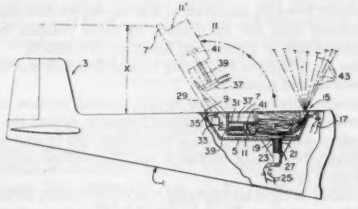
d. a flexible line;

e. means to exert controlled tension forces on one end of said line;

f. a pulley-like device swivelably attached to the other end of said rod, a portion of the length of said flexible line passing over the surface of said pulley-like device; and

g. means to independently manually selectively control said positioning means and said tensioning means.

4,113,208
AIRCHUTE EJECTION
Dario John Manfredi, 45-38 48th St., Woodside, N.Y. 11377
Filed Nov. 8, 1976, Ser. No. 739,709
Int. Cl.[2] B64D *17/70*
U.S. Cl. 244—139 **1 Claim**



1. In an aircraft having a fuselage and including, in combination, a tail assembly, means under the control of the pilot of the aircraft for ejecting a parachute into operative position connected to the fuselage of the aircraft for the safe vertical descent thereof, a cradle for the storage of said parachute, the cradle being open at both ends, and said cradle removably

disposed within the fuselage, the parachute being ejectable through one open end of said cradle, said cradle with the contained parachute being movable outwardly from the fuselage under the control of said means and into operative position for ejecting the parachute from said cradle into operative position supporting the fuselage, and the open end of said cradle through which said parachute is ejected when said cradle is in operative parachute ejecting position being in a horizontal plane above the tail assembly of the aircraft, and said fuselage being provided with a well, a closure member therefor openable under the control of said means, and said cradle being fixed to the underside of said closure, the open end of said cradle through which said parachute is ejected being disposed in uppermost position when said closure member is in fully opened parachute ejecting position, and a latching mechanism is provided for maintaining said closure member in well closing position, said latching mechanism being unlatched by said first named means for swinging movement of said closure member to fully open parachute ejecting position and further means extending through said well and in engagement with said cradle and operable by said first named means to provide an upward thrust to said cradle thereby forcing said closure member and the attached cradle into the airstream for moving it to fully open parachute ejecting position, additional means is mounted on said closure member adjacent to the other open end of the cradle and said additional means being caused to operate when said closure member is in open parachute ejecting position, the additional means when operated being in engagement with said parachute and operable to eject said parachute from the cradle.

4,113,209

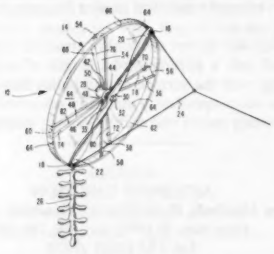
ROTATING KITE

Lewis Rodgers, 27470 Cochise Ave, Barstow, Calif. 92311

Continuation of Ser. No. 721,340, Sep. 8, 1976, abandoned. This application Oct. 11, 1977, Ser. No. 840,979

Int. Cl.[2] B64C *31/06*

U.S. Cl. 244—153 A **7 Claims**



1. A rotating kite comprising:

an elongated rigid control arm having a first free end and a second free end, said control arm having pitched blades to interact with the air tending to cause rotation of said control arm in a preferred direction of rotation;

means for affixing a kite string to said first and second free ends of said control arm;

a spindle rotatably affixed to the central portion of said control arm, said spindle being rotatable around the longitudinal axis thereof, said longitudinal axis of said spindle being substantially normal to the longitudinal axis of said control arm;

a plurality of rigid air engaging arms each fixedly secured on a first end thereof to said spindle and being radially disposed therefrom, the longitudinal axis of each of said air engaging arms being substantially perpendicular to said longitudinal axis of said spindle;

a ring-like element dimensioned to enclose the second free ends of each of said air engaging arms, said second free ends each being fixedly secured thereto, and

a membrane fixedly secured to the free edges of said ring-like element farthermost from said control arm, said membrane covering the area enclosed by said ring-like element, said membrane having a plurality of slots located therein, each of said plurality of slots being adjacent one of each of said plurality of air engaging arms, said slots permitting air currents imparting force on said air engaging arms to pass therethrough, said air currents causing said spindle to rotate.

4,113,210

FLEXIBLE AEROFOILS

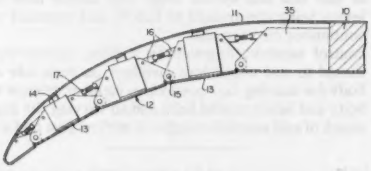
Donald Pierce, Aldershot, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Mar. 28, 1977, Ser. No. 781,866

Claims priority, application United Kingdom, Apr. 1, 1976, 13337/76

Int. Cl.[2] B64C *3/48*

U.S. Cl. 244—219 **3 Claims**



1. A flexible aerofoil comprising:

an internal structure including a bracket member;

a suction skin attached to said internal structure;

a pressure skin;

a series of rotatable members extending chordwise from said bracket member, each of said rotatable members being joined to at least one adjacent member by at least one joint to form a chain-like structure;

said pressure skin comprising a chordwise series of spanwise extending segments positioned adjacent to one another to provide a substantially continuous surface, each of said segments being secured to one of said members, said joints being adjacent said pressure skin, closer to the pressure skin than the suction skin;

a rod mounted for movement only in a spanwise direction for each of said joints;

means, adjacent said suction skin, closer to the suction skin than the pressure skin, connecting each of said rods to two adjacent ones of said members such that movement of said rod causes relative rotation of the joined rotatable members about spanwise extending axes passing through said joints and a consequent change in camber of said pressure skin; and

means connecting said suction skin to said rotatable members such that relative rotation of said rotatable members also causes a change in camber of said suction skin and such that the separation between said suction skin and said pressure skin is maintained in a predetermined relationship.

4,113,211

HOT BOX DETECTOR BEARING DISCRIMINATOR CIRCUIT

Arthur J. Glazar, Kings Park, N.Y., assignor to Servo Corporation of America, Hicksville, N.Y.

Filed Oct. 13, 1977, Ser. No. 841,700

Int. Cl.[2] B61K *9/04*

U.S. Cl. 246—169 A **5 Claims**

1. A method of discriminating between roller bearings and

friction bearings in a railroad hot box detector system comprising the steps of:

a. scanning the bearings of a railroad car on a section of track with an infrared scanner to generate an output signal in response to and having a waveform indicative of the infrared radiation of and type of bearing scanned;

b. feeding said waveform into a first integrating circuit to

obtain a value indicative of the overall area under said waveform;

c. feeding a preselected portion of said waveform into a second integrating circuit to obtain a value indicative of the area of the preselected portion of said waveform; and,

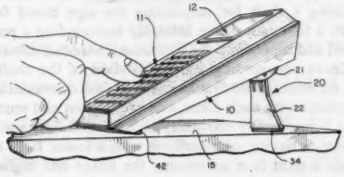
d. comparing the outputs of the first and second integrating circuits whereby to obtain a ratio indicative of the nature of the bearing being scanned.

4,113,212

COLLAPSIBLE ELECTRONIC CALCULATOR STAND

Paul Coriden, 5501 W. Irving Park Rd., Chicago, Ill. 60641

Filed Jun. 8, 1977, Ser. No. 804,782
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—13 **6 Claims**



1. A collapsible stand for small electronic calculators, comprising:

a base, and a leg pivotably mounted to the base for movement between an open position, for supporting the calculator at an angle, and a collapsed postion, the base and the leg formed from plastic;

the base including a flat base member and two parallel, spaced apart, walls extending upward from the base member, the bottom of the base member having an adhesive containing layer for fastening the base to the back of a calculator;

the leg having a non-skid foot at one end offset with respect to the longitudinal plane of the leg, for resting on a surface when the leg is in its open position, the opposite end of the leg having a pair of outwardly extending pins, the leg's pin end formed into a center and two outer arm members separated from one another by grooves, each of the outer arm members carrying a pin, the center arm member having a stop for resting against the base member and supporting the leg when the leg is in its open position;

each of the walls having an opening in which one of the pins is disposed and having an inwardly projecting stud for cooperating with the leg to lock the leg into position, the distance between th studs being less than the distance between the outer edges of the leg's two outer arm members;

the non-skid foot and the stop being offset between 100° and 120° from the plane of the leg;

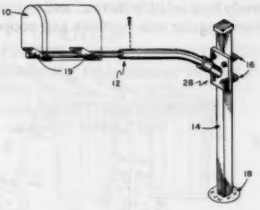
whereby the walls flex outwardly and the outer arm members of the leg flex inwardly as the leg passes over the studs, as the leg moves between its open and collapsed positions.

4,113,213

MAIL BOX SUPPORT

Guy R. Gay, and Neil Gay, both of P.O. Box A1, Weeks Mills, Me. 04361

Filed Mar. 10, 1977, Ser. No. 776,123
Int. Cl.[2] B65D *91/00*
U.S. Cl. 248—128 **1 Claim**



1. An improved mail box support arm device for affixation to a support post comprising:

a tubular arm base having a first and second end;

a tubular arm extension having a first and second end, said first end adapted to be slideably inserted within the first end of said arm base and affixed in a selected one of a plurality of positions to said arm base;

mail box mounting means positioned at the second end of said arm extension;

a shaft receipt member positioned within said arm base at its second end, said arm base being bent at a substantially 45° angle in proximity to said shaft receipt member, said shaft receipt member including at least one ball bearing member affixed therein and said arm base further having defined therein in proximity to said shaft receipt member a pin entry aperture;

a back plate member having defined therein at least one aperture for receipt of means to affix said device to a support post;

a shaft having a first and second end, the second end of said shaft extending from said back plate member at a substantially 45° angle, and having a shaft aperture defined laterally therethrough near its first end, said shaft's first end being inserted into said ball bearing member;

a shaft collar member surrounding a portion of said shaft in the vicinity of the second end of said shaft;

a pin member adapted to be inserted through said pin entry aperture in said arm base and into said shaft aperture so as to hold said arm base to said shaft; and

an arm base collar member affixed to said arm base surrounding said shaft receipt member and extending so as to surround and cover the area of contact between said shaft collar member and said shaft receipt member.

4,113,214

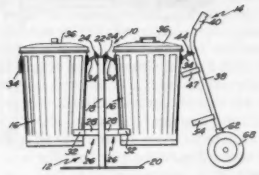
TRASH CAN TRANSPORTER

Leo Francis Dubois, Tower Hill Rd., Cumberland, R.I. 02864

Continuation-in-part of Ser. No. 619,682, Nov. 13, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,845
Int. Cl.[2] A47G *23/02*
U.S. Cl. 248—146 **2 Claims**

1. A mobile transporter for use in lifting a loaded garbage can onto or from a vertical support on which a flange is secured at the upper end thereof and a supporting bracket is secured intermediate the ends thereof, wherein the garbage can includes a body that tapers outwardly from bottom to top and has opposed handles joined to said body, one of said handles being engageable with said flange at the upper end of said

vertical support and the can body being engageable with said supporting bracket when said garbage can is mounted on said vertical support, the improvement comprising a central column having a U-shaped carriage joined to the lowermost end thereof and a handle joined to the uppermost end thereof, an axle extending through said carriage, wheels mounted on said axle for rotation relative to said carriage, an upper can brace and a lower can brace mounted on said column in spaced vertical relation for supporting said can during the transporting movement thereof, each of said can braces being formed in a one-piece construction and including outer angular side portions having ends that are joined to said column, inner angular side portions joined to said outer angular side portions and reversely bent relative thereto, and a central portion joined to said inner angular side portions and cooperating therewith



to define a pocket that is spaced forwardly relative to said column, the outer angular side portions of said lower can brace defining an angle with respect to said central column that is less than the angle that is defined therewith by the outer angular side portions of said upper can brace, wherein the pocket formed by said lower can brace extends more forwardly relative to said column than the pocket formed by said upper can brace, the pockets of each of said braces engaging the body of the can in supporting relation when said can is mounted on or lifted from said support by the transporter, the location of the can brace pockets compensating for the tapered configuration of said can body, and a handle bracket joined to said column adjacent to the upper end thereof and receiving the handle of the can thereover when said can is to be mounted on or removed from the vertical support by the transporter.

4,113,215

TILT MOUNTING HEADS

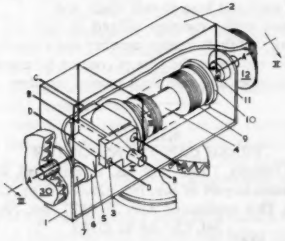
Harold Reginald Stapleton, Pakenham, England, assignor to W. Vinten Limited, Bury St. Edmunds, England

Filed Jan. 10, 1977, Ser. No. 757,933

Claims priority, application United Kingdom, Jan. 17, 1976, 01888/76

Int. Cl.² F16M *11/12*

U.S. Cl. 248—183 **16 Claims**



1. A tiltable mounting for an article, such as a camera or the like, comprising

first means for pivotably mounting about a first axis a tiltable support member on a base member, and

second means operably connecting said tiltable support member and said base member wherein said second means comprises a spring loaded cam operable on a cam follower which produces in operation a varying moment of force substantially equal and opposite to the moment of force produced when said tiltable support member with said article mounted thereon is tilted about said base member.

4,113,216

APPARATUS FOR HANGING A BOARD

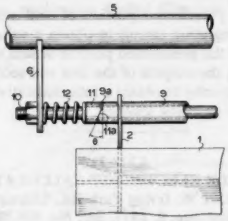
Takeshi Fuse, Kamakura; Toshio Yajima, Yokohama; Isao Hino, Amagasaki, and Shohei Oka, Minoo, all of Japan, assignors to Osaka Prefectural Office, Osaka, Japan

Filed Jan. 21, 1977, Ser. No. 761,278

Claims priority, application Japan, Jan. 23, 1976, 51-006864

Int. Cl.² A47B *96/06*

U.S. Cl. 248—204 **3 Claims**



1. An apparatus for suspending a sign board from a support, comprising a shaft for suspending the sign board from the support, a first cam sleeve rotatably surrounding a portion of the shaft and supporting the sign board, a second non-rotatable cam sleeve surrounding another portion of the shaft, and a spring for biasing said first and second cam sleeves axially into engagement with each other, one of said first and second cam sleeves being axially movable; each of said first and second cam sleeves having cam surfaces with a lower face, a higher face and a slant face connecting the lower and higher faces, said spring biasing the cam surfaces towards each other so that when wind pressure on the sign board is weaker than a first predetermined strength, the condition is maintained in which both slant faces of said first and second cam sleeves, and the higher face of the one and the lower face of the other correspond to and contact with each other, when wind pressure is greater than the first and less than a second predetermined strength, the first cam sleeve rotates and the rotating force of the sign board is absorbed by the compression of said spring caused by the relative sliding movement in an axial direction of one of the first and second cam sleeves and when wind pressure is greater than the second predetermined strength the first cam sleeve further rotates so that both higher faces of the first and the second sleeves contact each other so as to have the sign board rotate only against the force of sliding friction between the higher faces, the pressure of wind being exerted on the sign board being reduced by said rotation.

4,113,217

APPARATUS FOR REMOVABLY MOUNTING EQUIPMENT TO A VEHICLE

Joseph J. O'Connell, Albuquerque, N. Mex., assignor to Scientific Dimensions, Inc., Albuquerque, N. Mex.

Filed Apr. 7, 1977, Ser. No. 785,326

Int. Cl.² E05B *73/00*; F16B *41/00*

U.S. Cl. 248—221.3 **3 Claims**

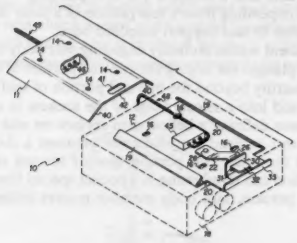
1. Apparatus for removably mounting equipment to a vehicle, comprising:

first and second generally planar frames, one of said frames adapted for attachment to the equipment and another of said frames adapted for attachment to the vehicle,

members defining grooves along opposite edges of said second frame,

said first frame having bends to form wings slideably receivable in a direction along said grooves and having a centrally located oblong hole for receiving a spring locking member,

and a spring locking member biased in a direction away from and attached at an end to said second frame, having a bend



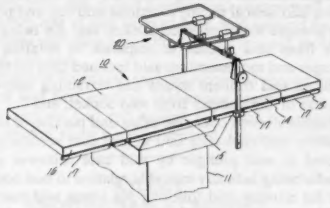
for engagement with walls of said oblong hole adapted to engage said oblong hole at least at four opposing locations to constrain the motion therewithin in a direction transverse to said slideable direction, to urge said wings of said first into engagement with said grooves of said second frame to constrain any relative motion therebetween, and to lock said first and second frames against sliding relative movement.

4,113,218

ADJUSTABLE FRAME ASSEMBLY FOR SUPPORTING A SURGICAL TRAY

Gerald S. Linder, 16693 Charmel La., Pacific Palisades, Calif. 90272

Filed Sep. 13, 1976, Ser. No. 722,798
Int. Cl.² A61G *13/00*
U.S. Cl. 248—291 **18 Claims**



1. An adjustable frame assembly adapted for attachment to an operating table for receiving and supporting a surgical tray above the operating table, comprising in combination:

(a) first and second upright supporting columns, each having an upper and a lower end, the lower end of each of said first and second supporting columns being adapted for secure attachment to the operating table;

(b) a horizontally-extending bar mounted between the upper ends of said first and second supporting columns for limited angular rotation about the longitudinal axis of said bar with respect to said supporting columns;

(c) at least one locking means intercoupled between one end of said horizontally-extending bar and one of said first or second supporting columns for locking the angular position of said horizontally-extending bar with respect to said one supporting column;

(d) first and second blocks spaced apart and mounted upon said horizontally-extending bar intermediate the ends of said bar;

(e) first and second vertically-extending posts supported, respectively, by said first and second blocks, said first and second posts extending substantially perpendicular to the longitudinal axis of said horizontal bar;

(f) a substantially rectangular open frame member adapted for receiving and supporting a surgical tray; and

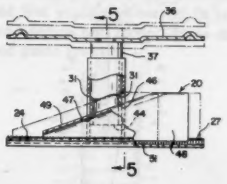
(g) first and second connecting members supported, respectively, by the upper ends of said first and second vertically-extending posts, said first and second connecting members having vertically-extending ends attached to said rectangular open frame member.

4,113,219

ADJUSTABLE PEDESTAL FOR ELEVATED FLOORS

David F. Mieyal, Strongsville, Ohio, assignor to Donn Products, Inc., Westlake, Ohio

Filed Jun. 3, 1977, Ser. No. 803,078
Int. Cl.² E04G *25/00*
U.S. Cl. 248—354 R **7 Claims**



1. A pedestal assembly comprising a lower base, and an upper carrier element, intermediate support means extending between the base and carrier element, elements for maintaining the carrier element in generally vertical alignment with the base, said support means including adjustment means for adjustably determining the height of the carrier element above the base within a range of adjustment, said adjustment means including a wedge element movable for adjustment of the carrier element relative to the base in a direction substantially perpendicular to the direction of height adjustment, means for locking said wedge element in a selected position of adjustment, said wedge locking means being arranged to be responsive to a downward force on said carrier element, said wedge locking means including taper locking means.

4,113,220

ADJUSTABLE GAS CYLINDER CHAIR CONTROL

Robert H. Godwin, and Herbert E. Collignon, both of Evansville, Ind., assignors to Bliss & Laughlin Industries Incorporated, Oak Brook, Ill.

Filed Jan. 31, 1977, Ser. No. 764,371
Int. Cl.² F16M *11/00*; F15B *15/17*
U.S. Cl. 248—400 **4 Claims**

1. An adjustable gas cylinder control comprising, in combination:

(a) a single tube having an axis and defining a single cylinder bore;

(b) a single piston in sealing engagement with said tube and slidable therein, said piston dividing said tube into a first and second compartment;

(c) a first end plug having a proximal portion and a distal portion, the proximal portion being adapted to sealably fit within one end of said tube thereby sealably enclosing the first compartment thereof;

(d) a second end plug having a central bushing portion and being adapted to sealably fit within the other end of said tube thereby sealably enclosing the second compartment thereof;

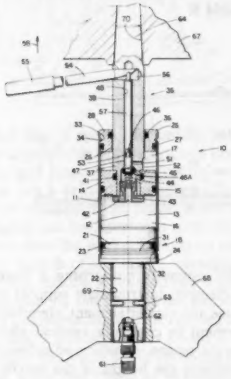
(e) a single spindle in sealing engagement with the bushing in said second end plug and slidable therein, said spindle having a proximal and a distal portion, the proximal portion being axially reciprocable in said tube, said piston being fixedly mounted on the proximal end of said spindle and reciprocable therewith;

(f) gas inlet means connected to said first end plug for charging and discharging the sealed first compartment of said tube with gas;

(g) valve means mounted in said piston and said spindle for allowing gas to flow between the first and second compartment of said tube thereby adjusting the position of said piston in said tube;

(h) lever means connected to the distal portion of said spindle for actuating said valve means;

(i) means for structurally supporting a chair seat and a chair base solely on the distal portion of said spindle and the distal portion of said first end plug, said first and second end plugs additionally comprising an abutment flange



adapted to abut the ends of said tube when said first and second end plugs are sealably fitted therein, said gas inlet means comprising an adjustable valve centrally located on the distal end of said first end plug and a central bore through said first end plug connecting said adjustable valve with the first compartment of said tube, said adjustable valve being adapted to allow easy charging and discharging of the sealed first compartment in said tube;

(j) a chair base having a central housing, the distal portion of said first end plug having a length of about twice the cross-sectional diameter thereof and including said adjustable valve being inserted in the housing in said chair base, the abutment flange on said first end plug being adapted to bear against said chair base adjacent the central housing therein; and

(k) a chair seat having a receiving mount, the distal end of said spindle located distally from said lever means being tapered and inserted in the mount in said chair seat to structurally support said chair seat thereon and above and apart from said chair base.

4,113,221

LOCKING DEVICE

Norvin J. Wehner, deceased, late of Kansas City, Mo. (by Virginia L. Wehner, surviving spouse), assignor to Cramer Industries, Inc., Kansas City, Kans.

Filed May 27, 1977, Ser. No. 801,055

Int. Cl.[2] F16M *11/04*

U.S. Cl. 248—408 **3 Claims**

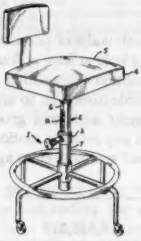
1. In a chair structure having a vertically adjustable seat supported on a post depending therefrom and slidably received in a bore of a support standard, a locking device therefor comprising:

(a) a body member having one end portion thereof mounted on a stationary support standard, said body member having a bore extending longitudinally therethrough and communicating with a mounting bore in said support standard;

(b) an elongated plunger slidably positioned within the bore in said body member and having one end portion thereof movable into a selected one of a plurality of sockets in a post depending from a seat portion of a chair structure and slidable in said support standard bore;

(c) resilient means mutually engaging said body member and said plunger for urging the one end portion of said plunger outwardly beyond the one end portion of said body member and into a selected one of the sockets in said post;

(d) means defining a helical cam surface on said body member and inclined longitudinally between a shoulder adjacent the other end portion thereof toward said one end portion and terminating in a pocket spaced from said other end portion, said body member pocket defined by body



member portions extending over the adjacent cam surface in spaced relation thereto;

(e) a cam follower pin connected to the other end portion of said plunger and extending radially outwardly thereof, said pin being movably engaged with said cam surface and receivable into said pocket in response to rotation of said plunger and said resilient means moving said follower pin down said helical incline to extend said one end portion of the plunger into a selected socket, said pin being removable from said pocket in response to rotation of said plunger and movement up said inclined cam surface compressing said resilient means and retracting said one end portion of the plunger from said socket; and

(f) a handle sleeved over said other end portion of said body member and enclosing said helical cam surface and connected to said plunger by said cam follower pin, said handle being helically movable relative to said body member for moving said follower pin along said cam surface and into said pocket and extending said plunger longitudinally through said body member and into a selected one socket in said post.

4,113,222

INTRAVENOUS POLE

Jerry C. Frinzel, 3208 Mission Ave., Carmichael, Calif. 95608

Filed May 31, 1977, Ser. No. 801,478

Int. Cl.[2] F16M *11/00*

U.S. Cl. 248—412 **7 Claims**

1. An intravenous pole comprising:

a. a tube extending from a lower end to an upper end;

b. a hollow stem partially disposed within said tube in telescoping relation thereto, said hollow stem having a bottom end inside said tube and a top located above said upper end of said tube;

c. a pair of oppositely extending horizontal support bars mounted on said top end of said hollow stem said support bars including means for supporting an intravenous bottle;

d. clutch means on said bottom end of said hollow stem for selectively engaging and disengaging the encompassing inside walls of said tube in order respectively to immobilize said hollow stem and to release said hollow stem;

e. an operating rod disposed within said hollow stem in telescoping relation thereto, said rod extending upwardly from a lower end in operating relation with respect to said clutch means to an upper end located above said top end of said hollow stem, said rod being movable between a first upper position in which said lower end of said rod actuates said clutch means and a second lower position in which said rod releases said clutch means;

f. trigger means mounted on said upper end of said operating

rod for urging said rod from said first position toward said second position, said trigger means including a crossbar centrally pivoted on said operating rod above said support bars and providing a pair of oppositely extending handles substantially parallel to said support bars when said rod is in said first upper position, and a pair of straps each depending from one of said handles into engagement with a respective one of said support bars, said support bars and said straps affording a stop limiting the upward movement of said rod; and,

g. spring means for urging said rod from said second position toward said first position, said spring means being effective to elevate said rod against the force of gravity but ineffective to resist a predetermined downward force.

4,113,223

CROSS-MOVABLE CARRIAGE

Yukio Kakizaki, Kawasaki, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Feb. 14, 1977, Ser. No. 768,608

Claims priority, application Japan, Feb. 27, 1976, 51-20153

Int. Cl.² F16M *13/00*

U.S. Cl. 248—430 **4 Claims**

1. A cross-movable carriage comprising:

a movable base plate having two first guide grooves formed in one surface thereof;

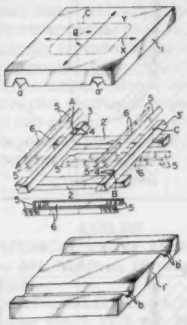
a stationary base plate having two second guide grooves formed in one surface thereof;

two first guide members capable of fitting in said first guide grooves;

two second guide members capable of fitting in said second guide grooves;

one of said second guide members and one of said first guide members being fastened together to form a first assembly, the other of said second guide members and the other of said first guide members being fastened together to form a second assembly, said first and second assemblies being movable relative to each other to allow for variances in the position of said first and second guide grooves;

said guide members constituting a guide mechanism between



said movable base plate and said stationary base plate to permit said first guide members to fit in said first guide grooves and permit said second guide members to fit in said second guide grooves.

4,113,224

APPARATUS FOR FORMING OPTICAL LENSES

James A. Clark, Honeoye Falls; Donald V. Livesey, and Richard J. Wrue, both of Rochester, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 564,403, Apr. 8, 1975, abandoned, and Ser. No. 693,402, Jun. 7, 1976, abandoned, said Ser. No. 693,402, is a division of Ser. No. 564,403, , which is a continuation-in-part of Ser. No. 466,933, May 6, 1974, abandoned. This application Jan. 27, 1977, Ser. No. 762,221

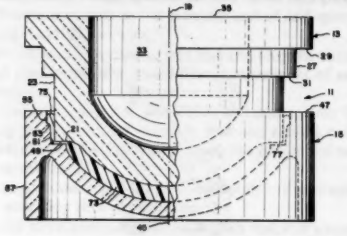
Int. Cl.² B29C *5/00*; B29D *11/00*

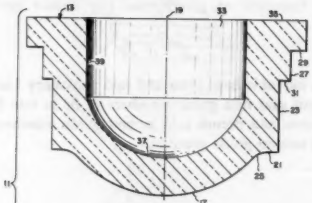
U.S. Cl. 249—105 **11 Claims**

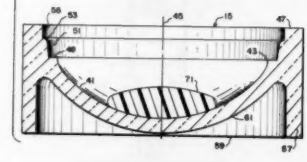
1. A lens mold comprising:

first and second cooperating mold members, said first mold member having a first mold surface, said second mold member having a second mold surface, said first and second mold surfaces cooperating to define a mold cavity, said first and second mold members including means for defining an annular reservoir, said first and second mold members also including means for defining an annular restriction interconnecting said reservoir with said mold cavity, said first and second mold members further includ-

ing means to align said mold members to control both the thickness and prism of the lens to be cast, said aligning







means being located on said first and second mold members between said reservoir and said mold cavity.

4,113,225

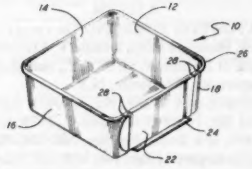
OPEN END BAKING PAN

Kenneth J. Corse, P.O. Box #181, Conklin, N.Y. 13748

Filed Jun. 10, 1977, Ser. No. 805,275

Int. Cl.[2] B41B *11/58*

U.S. Cl. 249—169 **3 Claims**



1. A baking utensil comprising:

three or more side portions and a bottom portion, one of said side portions having a removable member;

said removable member having one end thereof formed in a semi-circular pattern to enable said removable member to be used as a spatula to aid in removal of baked good product from said baking utensil;

a lip along a bottom of an opening of said side portion having a removable member to provide a leak-proof seal when said removable member is in place;

a curled lip around a top of said three or more side portions, said curled lip having one or more cuts therein to form sections of said curled lip which act as spring members to hold said removable member tightly in place.

4,113,226

APPARATUS TO ADJUST AND MAINTAIN THE DISTANCE BETWEEN WALL FORMS

Stanley Walski, Media, Pa., assignor to Con-Spec Devices Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 689,726, May 25, 1976, Pat. No. 4,058,285. This application Mar. 30, 1977, Ser. No. 782,877

The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.

Int. Cl.[2] E04G *17/08*

U.S. Cl. 249—216 **14 Claims**

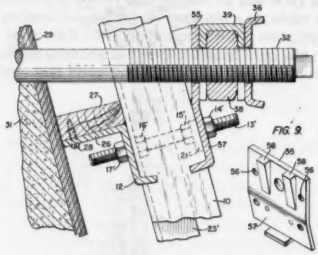


FIG. 2

1. Apparatus to adjust and maintain spacing between building members comprising

a front side plate having means to attach said front side plate to one of the building members,

a screw type wall tie adapted to extend between the building members and passing through said front side plate,

a nut mounted for rotation on said screw type wall tie,

means to enclose said nut attached to said front side plate and enclosing said nut,

said wall tie passing substantially through laterally centered openings in said front side plate and said nut enclosing means,

means to receive and attach to said screw type wall tie mounted on the opposite end of said wall tie and adapted to be attached to the other of the building members,

said means to enclose said nut including an auxiliary front side plate having U-shaped guide portions on laterally opposite ends of said auxiliary front side plate,

and means attaching said auxiliary front side plate to said front side plate.

4,113,227

CAM LOCK WITH VERTICAL PLUNGER

Irving Louis Cigliano, Oceanside, N.Y., assignor to Marine Moisture Control Co., Inc., Long Island, N.Y.

Filed Apr. 5, 1977, Ser. No. 784,702

Int. Cl.[2] F16L *23/02*

U.S. Cl. 151—54 **10 Claims**

1. A coupling device for coupling together a pair of heavy pipes or hoses, comprising:

a clamp support;

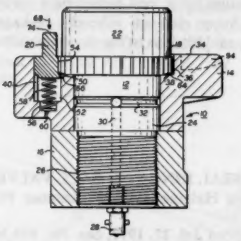
a bolt threadedly received within and coupled to said clamp support, said bolt including a shank portion;

a rotable cam element retatable about said bolt and held to said clamp support as a unit; and,

moisture free releasable spring urged locking means to lock said cam element to said bolt to prevent rotation in any direction and for permitting the egress of liquid;

said releasable locking means including a ring gear fixed to said bolt and peripherally disposed on said shank portion, and

a spring urged plunger element carried by said cam element and movable in a direction parallel to the axis of said bolt,



said ring gear and said plunger having teeth axially aligned with the axis of said bolt and complementary to each other and adapted for engagement with each other.

4,113,228

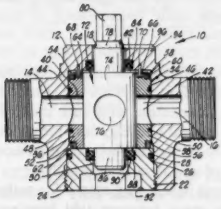
ROTARY PLUG VALVE

James A. Frye, 1720 Drakestone, Oklahoma City, Okla. 73120

Continuation-in-part of Ser. No. 654,081, Feb. 2, 1976, abandoned. This application Oct. 26, 1976, Ser. No. 735,699

Int. Cl.[2] F16K *5/00, 5/18, 25/00*

U.S. Cl. 251—159 **8 Claims**



1. A rotary plug valve comprising:

a valve body defining a generally cylindrical bore and having inlet and outlet fluid passageways disposed therein on opposite sides of said bore, said bore being positioned transversely to said fluid passageways;

a pair of split, semi-cylindrical complementary liner members, including an upstream liner member and a downstream liner member, together forming a generally cylindrical liner positioned in said bore, said liner having inlet and outlet fluid passageways in said valve body, and said liner including a pair of longitudinally spaced annular grooves extending in substantially parallel planes and spaced along said cylindrical bore from each other;

a pair of radially elastically deformable, spaced retaining members disposed in tension around said liner and positioned in said annular grooves, said grooves having a depth at least equal to the thickness of the respective retaining member positioned therein whereby the outer cylindrical peripheral surface of said generally cylindrical liner is positioned radially outwardly at all points thereon from the radially outermost portion of each of said radially elastically deformable, spaced retaining members, and said retaining members are spaced radially inwardly from the valve body at a time when the outer cylindrical peripheral surface of said generally cylindrical liner is in contact with said valve body;

a cylindrical valve plug rotatably positioned within said generally cylindrical liner, and defining a flow passageway therein positioned for alignment and registry with said liner fluid passageways upon rotation, the dimensions of said valve plug, said liner members forming said liner and said retaining members being such that at pressures in the lower part of the working range of said valve, said retaining members are held in an elastically deformed condition and said valve plug and liner are maintained in forceful contact with each other independent of said valve body, and such that at relatively higher pressures above a predetermined intermediate pressure, said retaining members are elastically expanded by the force from the development of line pressure between said upstream liner member and said valve plug, and said upstream liner member and said valve plug separate, reducing the force required to open said valve; and

seal means interposed between said liner and said valve body about the peripheries of said fluid passageways in said liner.

4,113,229

SPHERICAL VALVE ASSEMBLY

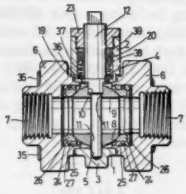
Katsuji Fujiwara, 191, Nishitani, Hiroaka-cho, Kakogawa-shi, Hyogo-ken, Japan

Continuation of Ser. No. 621,127, Oct. 9, 1975, abandoned. This application Jun. 8, 1977, Ser. No. 804,589

Claims priority, application Japan, Oct. 18, 1974, 49/120475

Int. Cl.[2] F16K *25/00*

U.S. Cl. 251—174 **1 Claim**



1. A spherical valve assembly comprising:

a valve casing including an integrally formed main casing member and means defining a fluid passage through said valve casing;

means in said main casing member defining therein a valve stem supporting orifice and a sustaining stem supporting recess arranged in axial alignment with each other on opposite sides of said fluid passage defined through said valve casing;

a one-piece stem member including an upper valve stem portion, a flanged portion immediately adjacent thereto, a key portion adjacent said flanged portion and a sustaining stem portion extending from said key portion, said one-piece stem member being rotatably mounted within said valve casing to extend continuously across said fluid passage within and between said valve stem supporting orifice and said sustaining stem supporting recess with said upper valve stem portion fitted in said valve stem supporting orifice and with said sustaining stem portion fitted in said sustaining stem supporting recess thereby to mount said one-piece stem member to be rotatable about a substantially fixed immovable axis extending across said fluid passage;

a valve sphere having defined therethrough a fluid flow passage orifice adapted to be aligned with said fluid passage of said valve casing when said valve is in the open condition, said valve sphere being mounted upon said sustaining stem portion of said one-piece stem member and located within said fluid passage with said sustaining stem portion of said stem member extending in a direction generally perpendicularly to said fluid flow passage orifice in said valve sphere,

said valve sphere being structured to effect opening and closing of said fluid passage upon rotation of said one-piece stem member with simultaneous rotation therewith of said valve sphere;

fitting openings defined in said valve sphere arranged to receive therethrough said sustaining stem portion for mounting said sphere upon said one-piece stem member with said sustaining stem portion thereof extending completely across said fluid flow passage orifice of said valve sphere between said fitting openings thereby mounting said sphere upon said sustaining stem portion in an arrangement fixedly attaching said sphere relative to said one-piece stem member in tight engagement therewith;

a stem member receiving hole formed in said casing engaged about said flanged portion of said one-piece stem member;

a key slot formed in said valve sphere immediately adjacent one of said fitting openings thereon and having said key portion of said stem member engaged therein;

annular valve seat means displaceably mounted within said casing for supporting engagement with said valve sphere;

means resiliently urging said annular valve seat means into engagement with said valve sphere to enable movement of said valve seat means relative to said casing thereby to absorb variations in dimensional tolerances between said valve seat means and said valve sphere to thus accommodate rotation of said one-piece stem member to enable said rotation to occur about said fixed axis with said valve sphere fixedly mounted upon said one-piece stem member in tight engagement therewith; and

seat holders interposed between said valve seat means and said resiliently urging means;

said valve casing including a pair of end members tightly engaging on opposite sides of said main casing member, said end members having formed therein orifices forming a part of said fluid flow passage, said orifices including enlarged portions wherein said valve seat means are mounted with said resiliently urging means being interposed between inner walls of said end members and said valve seat means.

4,113,230

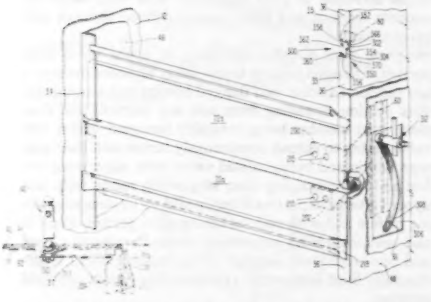
ROTATING BLADE FIRE DAMPER

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Continuation-in-part of Ser. No. 689,994, May 26, 1976, Pat. No. 4,081,173. This application Feb. 22, 1977, Ser. No. 770,831

Int. Cl.[2] F24F *13/14;* F16K *1/22*

U.S. Cl. 251—305 **12 Claims**



1. In an air control damper having a frame, at least one blade, rotation means for allowing selective rotational displacement of said blade with respect to said frame between open and closed positions, the improvement wherein said frame comprises a longitudinally extending, inwardly depending flange disposed within a plane which is substantially parallel to the plane of said blade in the closed position, said rotation means for allowing selective rotational displacement of said blade with respect to said frame comprising at least one integral hinge element notched from said flange and at least one complementally configured hinge portion in said blade adapted to slidingly engage said hinge element, said notch in said flange further comprising at least two portions, a first transverse portion for at least providing clearance of said hinge portion of said blade upon rotation of said blade, and a second longitudinal portion of smaller transverse dimension than said first transverse portion for at least providing a portion of the structure of said hinge element, whereby leakage through said damper when said blade is in the closed position is minimized.

4,113,231

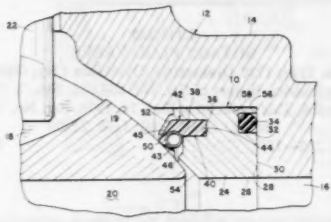
SEAL RING FOR BALL VALVES

Joseph Charles Halpine, 1908 W. Latimer Pl., Tulsa, Okla. 74127

Filed Jul. 27, 1977, Ser. No. 819,356

Int. Cl.[2] F16K *5/00*

U.S. Cl. 251—317 **1 Claim**



1. In a ball valve having a housing, an inlet duct through said housing for flow of fluid, a cylindrical seat and shoulder for a seal ring means concentric with said duct, a spherical ball inside the cavity of said housing, duct means through said ball and shaft means to rotate said ball about an axis perpendicular to the direction of said duct in said ball;

the improvement in seal ring means for sealing against fluid pressure the space between said housing and said ball, comprising:

(a) a circular metal ring having an outer cylindrical surface, an inner cylindrical surface and a first end wall perpendicular thereto, said outer cylindrical surface and said first end wall adapted to fit said cylindrical seat and shoulder of said housing;

(b) first means to seal said seal ring means to at least one of said cylindrical seat and shoulder;

(c) a cylindrical groove, concentric with said seal ring means in the second end wall of said seal ring means, near the outer perimeter of said second end wall;

(d) a thin-walled cylindrical extension to said second end wall at the outer edge of said cylindrical groove;

(e) seat ring means, having in cross section a cylindrical portion adapted to fit into said cylindrical groove and a "C" shaped portion enclosing a ring cavity of circular cross section, the outer wall of said "C" shaped portion having two conical surfaces joining in a circular ridge having a selected radius of curvature;

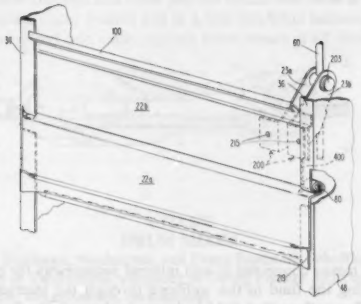
(f) a helical spring of selected wire of selected diameter and selected length adapted to fit into said ring cavity in said C-shaped portion;

whereby when said spring is placed in said ring cavity and said seat ring is inserted into said groove and said thin-walled cylindrical extension bent inwardly over said seat ring, it will be held snugly in said groove and will retain said spring and when said seal ring means is placed in said housing, said circular ridge will press against the spherical surface of said ball to seal the space between said housing and said ball against the pressure of fluid in said inlet duct.

4,113,232
SMOKE, FIRE AND AIR CONTROL DAMPER WITH STAMPED BLADE

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Continuation-in-part of Ser. No. 689,994, May 26, 1976, Pat. No. 4,081,173. This application Oct. 4, 1976, Ser. No. 729,831
Int. Cl.[2] F24F *13/14*; F16K *1/22*
U.S. Cl. 251—305 **5 Claims**

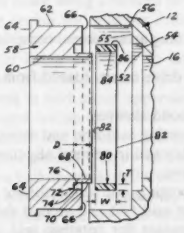


1. A damper, comprising: a frame, at least one blade associated with said frame, and rotation means for allowing selective rotational displacement of said blade with respect to said frame between open and closed positions; said rotation means comprising a plurality of hook-shaped hinge portions integrally formed from said blade, said blade comprising a plurality of substantially parallel spaced apart surfaces joined by at least one transverse connecting portion, at least a portion of one of said surfaces having been notched to form at least a portion of said hook-shaped hinge portions.

4,113,233
SEAT STRUCTURE FOR GATE VALVES

John A. Bond, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 11, 1977, Ser. No. 841,225
Int. Cl.[2] F16K *3/00*
U.S. Cl. 251—328 **5 Claims**



1. A gate valve structure comprising a valve body having a valve chamber therein and inlet and outlet flow passages communicating with the valve chamber, a gate element slidably mounted within the valve chamber for movement between open and closed positions, said valve body having a recess about each flow passage defined by small and large diameter stepped counterbores, said small diameter counterbore forming a rear end wall and an intermediate annular wall perpendicular to the rear end wall, said large diameter counterbore forming an intermediate end wall and an outer annular wall perpendicular to the intermediate end wall;

a seat ring fitting within each recess and having inner and outer peripheral surfaces, said inner peripheral surface axially aligned with the forming a continuation of the associated flow passage and said outer peripheral surface in facing contact with said outer annular wall;

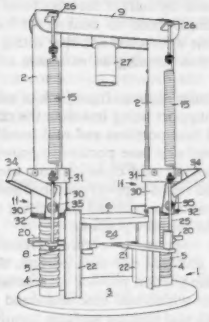
said seat ring having a rear face and a lip projecting from said rear face in abutting contact with said rear end wall, the inner peripheral surface of the lip forming a continuation of the flow passage and being coextensive with the inner peripheral surface of the seat ring, said rear face having a groove adjacent said lip with the outer peripheral surface of the lip defining the inner side of the groove, said groove defining with the small diameter counterbore a pocket of a generally rectangular cross-section;

and a deformable seal of an elongate cross-section positioned within the generally rectangular pocket, said seal filling substantially the entire cross-sectional area of the pocket when the seat is passed within the recess.

4,113,234
HYDRAULIC JACKS

Donald Charles Wride, 35 Helen Ter., Valley View, South Australia, Australia (5093)

Filed Oct. 13, 1977, Ser. No. 841,723
Claims priority, application Australia, Oct. 18, 1976, PC7765
Int. Cl.[2] B66F *1/08*
U.S. Cl. 254—108 **10 Claims**



1. A hydraulic jack support for a jack which is independent of the support comprising:

a pair of telescopic members, one of said telescopic members comprising a base plate and spaced upstanding support means secured to said base, the other said member comprising a bridge and guide means, said guide means engaging said support means to guide said bridge toward and away from said base;

a platform for supporting a jack disposed between said base and said bridge engaging said support means to be movable along said support means to be variable in distance from said base;

means to lock said platform to said support means;

means to lock said bridge and guide means to said support means;

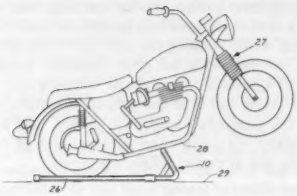
means to release said lock means; and,

spring means connected between said bridge guide means and said platform whereby to urge said platform toward said bridge, whereby an independent lifting jack can be positioned on said platform to have the lifting ram of said jack engage said bridge in relation to said platform and whereby said platform is raised by said spring means for a multi-stage lift.

4,113,235
LEVER-ACTION LIFT JACK

Wilbert Hartman, Jr., 2774 S. Pierce St., Denver, Colo. 80227

Filed Aug. 18, 1977, Ser. No. 825,680
Int. Cl.[2] B66F 7/22
U.S. Cl. 254—131 11 Claims



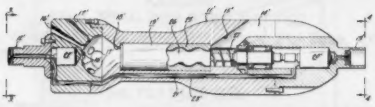
1. A lever-action jack comprising:
a single tubular body forming a cross-support and
a pair of opposed lever members at opposite ends of said cross-support,
each of said lever members including a base portion and a stand portion and having an acute-angle bend between each stand portion and an associated base portion providing a rocking surface along the outside of said acute-angle bend and a right-angle bend between each end of said cross-support and one of said stand portions,
each of said stand portions extending at an acute inside angle relative to an associated base portion to locate said cross-support at an intermediate portion back beyond the midpoint between the ends of the associated base portion from the acute-angle bend to counteract loading forces that tend to cause a forward and rear tilting under load; and
a handle portion forming an extension of one of said base portions,
the perpendicular distance from each of said base portions to said cross-support being less than the combined length of one of said base portions and said handle portion extending from said one base portion to provide a longer lever arm for moving said cross-support means between said lowered and raised support positions and to provide stabilization against forward and rear tilting of the lever means in the raised support position,
whereby, in response to a turning force applied to said handle portion and said one base portion, the handle portion and said one base portion provide a force arm with a fulcrum at one end about which said base and stand portions turn in a lever action with said rocking surfaces turning on a supporting surface to move said cross-support from a lowered position with said cross-support and said stand portions resting on a supporting surface to a raised support position with said base portions resting on the supporting surface and said cross-support disposed above said base portions.

4,113,236
PULLING TOOL APPARATUS

Gary S. Neinast, Plano, Tex., assignor to Suntech, Inc., St. Davids, Pa.

Filed Aug. 23, 1976, Ser. No. 714,208
Int. Cl.[2] E21B 43/00; B65H 59/00; E21C 29/16; H02G 1/08
U.S. Cl. 254—134.5 5 Claims

1. A pulling tool for use in a wellbore having fluid therein to pull a cable and associated apparatus through the wellbore, said tool comprising:
(a) an elongated housing having an internal fluid flowpath therein which includes,
(i) an internal passageway,
(ii) a fluid inlet at a first end, and
(iii) a fluid outlet at the second end, so that fluid can flow through the fluid inlet, the internal passageway, and the fluid outlet; wherein said outlet comprises a plurality of discharge passageways extending from the internal passageway to the second end of the housing, said discharge passageways being angled rearwardly and sufficiently parallel to the wellbore to provide a thrust of fluid in a direction opposite to the direction of fluid flow through the internal fluid flowpath.
(b) means for connecting the housing to the cable to be pulled through the wellbore;

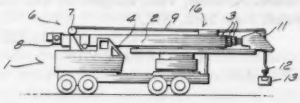


(c) means connected to said internal passageway for propelling the fluid in the wellbore through the internal fluid flowpath so that fluid is drawn in through the fluid inlet and expelled through the fluid outlet, thereby providing a force which pulls the cable and associated apparatus through the wellbore in a direction opposite to the direction of fluid flow through the internal fluid flowpath; and
(d) means for driving the propelling means.

4,113,237
CABLE TENSION CONTROL

Philip A. Derrwaldt, Mukwonago, Wis., assignor to D. G. Beyer, Inc., Milwaukee, Wis.

Filed Oct. 28, 1975, Ser. No. 625,822
Int. Cl.[2] B66D 1/76
U.S. Cl. 254—175.7 5 Claims



1. A load handling arrangement comprising, in combination;
a drum,
cable pay-out drive means spaced from said drum and comprising
first and second sheaves,
means supporting said first and second sheaves in spaced relationship and in general alignment with each other,
a third sheave,
means supporting said third sheave between and offset relative to said first and second sheaves,
and drive means for rotating said third sheave in one direction and permitting said third sheave to be rotated freely in response to retrieval of cable by said drum,
a cable reaved on said sheaves so that said cable follows a nonlinear path through said sheaves,
said cable coiled on said drum and extending from said drum to said cable pay-out drive means,
said cable pay-out drive means operative to draw cable from said drum and maintain constant tension on said cable between said drum and said cable pay-out means,
second drive means separate from said cable pay-out drive means and connected to said drum and operative to rotate said drum in one direction to coil said cable on said drum and said drum being freely rotatable in a pay-out direction,
and load engaging means connected to said cable with said

cable pay-out drive means located intermediate said drum and said load engaging means so that said load engaging means is lowered by said cable pay-out drive means drawing cable from said drum and is raised by said drum retrieving cable through said cable pay-out means and so that by reason of said cable pay-out means drawing said cable from said drum in a pay-out direction and said second drive means retrieving said cable by drawing said cable through said cable pay-out means said cable is maintained under tension and in a taut condition between said drum and said cable pay-out drive means at all times.

4,113,238
DRUM MIXER

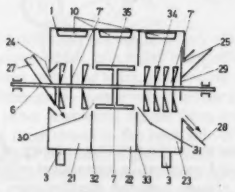
Franz Hofmann, Neuhausen, and Franz Szatmari, Schaffhausen, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Oct. 6, 1976, Ser. No. 729,979

Claims priority, application Switzerland, Oct. 10, 1975, 13208/75

Int. Cl.² B28C 5/18; B01F 9/08

U.S. Cl. 366—56 **10 Claims**



1. Mixer apparatus for treatment of bulk materials, particularly foundry sand, comprising: a drum mounted for rotation about an axis which extends at least approximately in a horizontal direction, said drum being arranged to define therein an upper drum interior region and a lower drum interior region located, respectively, above and below said axis, said lower drum interior region being arranged to have accumulated therein during rotation of said drum a portion of the bulk material being treated in said mixer apparatus; stationary deflection means arranged within said drum in said upper region thereof; rotating impact rotor means rotatably mounted within said drum at a location generally below said stationary deflection means to receive bulk material deflected therefrom and to enhance the mixing effect of said apparatus, said rotating impact rotor means including shaft means having a plurality of rigid rotor arms mounted thereon, said rotor arms being arranged to extend radially from said shaft means into said lower drum interior region a distance short of the lowermost point therein to permit in said lower drum region an accumulation of bulk material at a location out of the path of said rotating rotor arms; rotation of said drum about said axis operating to propel bulk material located therein upwardly by centrifugal force against said deflection means, said deflection means being structurally configured to deflect and direct said bulk material propelled thereagainst by rotation of said drum away from the inner wall of said drum into a downwardly falling jet directed at said rotating impact rotor means; and means unassociated with said impact rotor means and said deflection means for effecting axial conveyance of said bulk material through said drum.

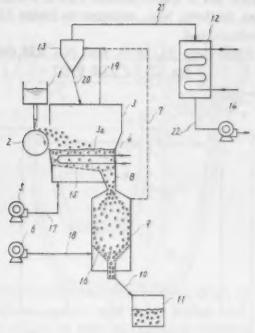
4,113,239
APPARATUS FOR COOLING SLAG

Tetsuro Nakada, Chiba; Makoto Shimizu, Yokosuka, and Mayumi Yoshinaga, Takarazuka, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote and Sumitomo Metal Industries, Ltd., Osaka, both of, Japan

Filed Dec. 27, 1977, Ser. No. 864,252

Int. Cl.² F27D 15/02

U.S. Cl. 266—137 **8 Claims**



1. An apparatus for cooling slag comprising a device for converting molten slag into slag granules, a fluidized bed type cooler with a fluidized bed of solid particles through which passes gas, a moving bed type heat-exchanger which is communicated with the bottom of said cooler and which has a moving bed of slag granules through which passes gas, and a classifying pipe interconnecting between said cooler and said heat-exchanger for classifying the slag granules from solid particles of said fluidized bed.

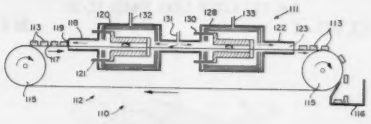
4,113,240
CONTINUOUS OPEN-ENDED SINTERING FURNACE SYSTEM

Gerhart P. Klein, Manchester, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 623,173, Jan. 16, 1976, abandoned. This application Feb. 16, 1977, Ser. No. 769,369

Int. Cl.² F27B 5/16

U.S. Cl. 266—252 **4 Claims**



1. A continuous sintering furnace system comprising:
(a) entrance and exit sections,
(b) a preheat chamber communicating with said entrance section,
(c) a first sintering chamber adjacent to and communicating with said preheat chamber,
(d) a connecting chamber connecting said first sintering chamber with a second sintering chamber,
(e) a cooling chamber adjacent to said second sintering chamber and communicating with it and said exit section,
(f) heating means disposed in said first and second sintering chambers,
(g) conveyor means carrying workpieces through said entrance section, said chambers, and said exit sections, and
(h) gas inlet means communicating with said first and second sintering chambers near their central portions, and a gas

inlet means communicating with said connecting chamber substantially midway between said first and second sintering chambers,

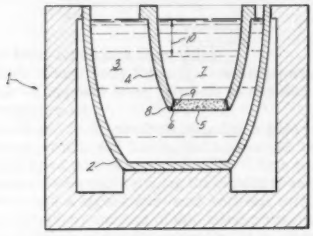
whereby there is a continuous gas flow toward both said entrance and exit sections.

4,113,241

APPARATUS FOR THE FILTRATION OF MOLTEN METAL IN A CRUCIBLE TYPE FURNACE

James E. Dore, Ballwin, Mo., assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Sep. 22, 1977, Ser. No. 835,649
Int. Cl.² C22B 9/02
U.S. Cl. 266—227 **25 Claims**



1. An improved filtration apparatus for filtering molten metal used in the production of castings comprising:

a furnace crucible;

means to charge said furnace crucible with molten metal; a ladling crucible positioned in said molten metal within said furnace crucible;

said ladling crucible being formed at least in part of a material having an open cell structure characterized by a plurality of interconnected voids; and

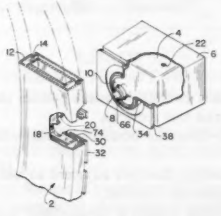
wherein said ladling crucible includes means to vertically slide within said furnace crucible on a support.

4,113,242

RELEASABLE, HIGH-PRESSURE SEAL AND METHOD OF FORMING SAME

Robert R. Holman, Bethel Park, and Daniel N. Turkall, West Mifflin, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 1, 1976, Ser. No. 737,761
Int. Cl.² G21F 5/00; B65D 51/00
U.S. Cl. 277—1 **26 Claims**



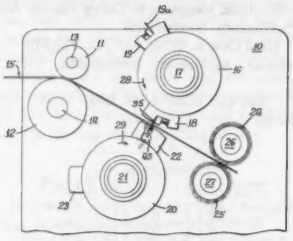
23. A method for establishing a releasable high-pressure seal between two sets of conduits, each set having an outer conduit and at least one inner conduit rigidly secured to the outer conduit, at least one of the inner conduits projecting past an end of the associated outer conduit a sufficient distance so that when the conduit sets are axially moved towads each other the inner conduits establish contact before the outer conduits do, the method comprising the steps of: positioning the conduit sets in substantial alignment with each other; placing a sealing member between the outer conduits; moving the conduit sets in an axial direction towards each other; engaging ends of the inner conduits to thereby axially align the conduit sets; continuing the relative axial movement of the conduit sets until the sealing member is engaged by both outer conduits; securing the ends of the outer conduits to each other to establish an initial sealing force between the outer conduits and the sealing member; raising the fluid pressure interiorly of the outer conduits relative to the ambient fluid pressure; and increasing the sealing force between the outer conduits and the sealing member as a function of the interior fluid pressure increase.

4,113,243

COMBINATION WEB TUCKER AND KNIFE WITH WEB GRIPPERS AND ANVIL

Clyde G. Gregoire, Bensenville; James A. Hartman, Brookfield, and Joseph M. Gregoire, Berwyn, all of Ill., assignors to Gregg Engineering Corp., Lyons, Ill.

Filed Aug. 8, 1977, Ser. No. 822,423
Int. Cl.² B41F 13/56
U.S. Cl. 270—21 **7 Claims**



1. In an apparatus for the printing industry of the type having first and second cooperative operational rollers which have a continuously printed web fed therebetween, comprising a first tool carrying box adjustably mounted on the outer circumference of the first of said cooperative operational rollers, said first tool carrying box having a tool of a combination web tucker and knife projecting radially outwardly from said first operational roller, a second tool carrying box adjustably mounted on the outer circumference of the second of said cooperative operational rollers, said second tool carrying box having a tool of combination web grippers and an anvil, said cooperative operational rollers rotatably driven in opposite directions and the first and second boxes arranged on said rollers to tangentially engage each other during rotation, means opening and closing said web grippers at desired times during the rotation of said rollers, the said web grippers being in an open condition at a time when the first and second boxes are approaching an adjoining tangential relationship to permit the combination web tucker and knife to push a bight portion of the printed web into the open web grippers and causing the knife to sever the bight portion of the web when the knife engages the anvil of the combination web grippers and an anvil causing the formation of severed ends of the printed web, and when said boxes start separating again by continued rotation of the rollers the combination web tucker and knife pulls out of the web grippers and the web grippers close on and hold the severed ends of the printed web, said web grippers comprising a stationary jaw having a web gripping portion and a movable jaw having a web gripping portion arranged and constructed to move toward and away from the stationary jaw to effect a gripping of the printed web by the cooperation of the web gripping portions, and one of said jaws having an anvil located beneath its web gripping portion thereof and projecting toward the other of said jaws, and the other of said jaws having a cooperative recess located beneath its web gripping portion

thereof and adapted when the jaws are in closed gripping position to telescopically receive the projecting anvil.

4,113,244

APPARATUS FOR AUTOMATICALLY FEEDING INDIVIDUAL SHEETS FROM A STACK THROUGH AN OFFICE MACHINE

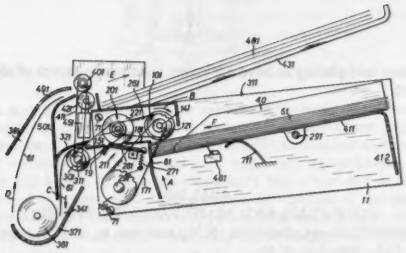
Kurt Ruenzi, Kuesnachterstrasse 59, 8126 Zumikon, Switzerland

Continuation-in-part of Ser. No. 674,918, Apr. 8, 1976, Pat. No. 4,032,135. This application Mar. 21, 1977, Ser. No. 779,755

Claims priority, application Switzerland, Apr. 5, 1976, 4207/76; Apr. 15, 1975, 4758/75

Int. Cl.² B65H 5/22

U.S. Cl. 271—4 **7 Claims**



1. An apparatus for the automatic supply of individual sheets from a sheet supply stack to a roller in an office machine and back onto a sheet receiving stack, comprising sheet separating means, first sheet guide means which guide the sheets delivered by said sheet separating means from said sheet supply stack and feed these sheets to the back side of said roller, and second sheet guide means arranged in front of said roller, said second sheet guide means moving a sheet upwardly onto said sheet receiving stack located substantially above said supply stack, wherein said first sheet guide means deflects the sheets supplied by the sheet separating means by an angle of at least 45°, preferably by an angle of 90° toward said roller in the office machine, and wherein said second guide means comprise funnel means for the sheets for deflecting the sheets delivered by said roller into a direction which is extending substantially oppositely to the supply direction of said sheets of paper, wherein said second guide means further comprise two sheet withdrawing rollers arranged downstream of said funnel means, electromagnet means operatively connected to selectively separate said two withdrawing rollers from each other, and motor means operatively connected for positively driving at least one of said two withdrawing rollers, and wherein said sheet separating means comprises tiltable rocker means to hold the sheet supply stack, said sheet separating means further comprising a stop member against which the leading edges of the sheets in the sheet supply stack rest.

4,113,245

COMBING WHEEL FEED NIP WITH SECOND SHEET RESTRAINT

Donald Francis Colglazier; John Leslie Fallon; Ernest Paul Kollar, all of Longmont, and Fred Ralph Mares, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,570

Int. Cl.² B65H 3/52

U.S. Cl. 271—10 **11 Claims**

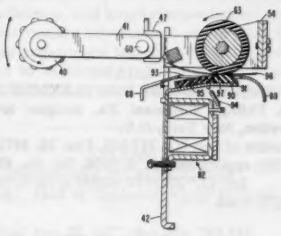
6. A closable drive nip adapted to receive the leading edge of the foremost one of a group of sheets which are shingled thereto by operation of a combing wheel, comprising:

a drive roller operable to feed the foremost shingled sheet in a given direction downstream of said roller;

a nip closing member spaced from said drive roller to define a drive nip;

means operable to produce relative movement between said drive roller and said nip closing member to effect closing of said drive nip;

a low friction, drive-roller-engaging member mounted on said nip closing member and cooperating with said drive



roller to physically push the leading edge of the foremost shingled sheet against said drive roller; and

a recessed surface on said nip closing member upstream of said drive roller defining a step operable when said drive nip is closed to positively stop and capture the leading edge portions of the shingled sheets underlying the one which is being fed by said drive roller, to thereby inhibit feeding of the sheet immediately underlying the one fed sheet.

4,113,246

EXERCISING APPARATUS

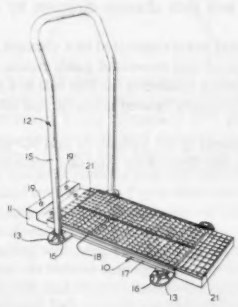
David James Gibbs, 6 Linden Close, Green Park, Wootton Bassett, Swindon, Wiltshire, England

Filed Jun. 7, 1976, Ser. No. 693,965

Claims priority, application United Kingdom, Jun. 7, 1975, 24542/75

Int. Cl.² A63B 23/06

U.S. Cl. 272—69 **2 Claims**



1. Exercising apparatus comprising a supporting framework including a platform on which the user of the apparatus can stand and handgrip means for gripping by a person standing on the platform, said platform having a presented surface afforded by a multiplicity of rollers comprising a plurality of closely spaced rows of rollers which each row of rollers containing a plurality of closely spaced independently rotatable rollers, the rollers being of smooth cylindrical form and of uniform size with a diameter no more than about an inch and a length no more than about an inch, said rollers being arranged for rotation about substantially horizontal axes contained in a common

plane, the platform including a frame having parallel side members and a central rib disposed intermediate the side members, a plurality of parallel spindles extending between the central rib and each of the side members and the rollers being individually mounted on said spindles.

4,113,247

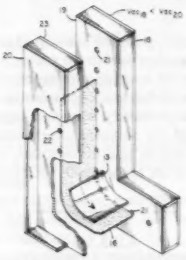
EDGE VACUUM GUIDE FOR FLEXIBLE MEMBERS

Edwin R. Phillips, Rosemont, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 317,815, Dec. 22, 1972, abandoned. This application Jul. 5, 1974, Ser. No. 486,245

Int. Cl.[2] **271**/*194;* **B65H** *5/22, 5/38*

U.S. Cl. 271—264 **2 Claims**



1. A system for transferring a flexible member in a path between locations comprising:

(a.) a two-sided, flat guide means only wherein said member traverses said path perpendicular to each side thereof, said path being substantially linear;

(b) a two-sided, flat extension connected to said guide means such that said path changes direction by approximately 90°;

(c) symmetrical ports connected to a vacuum means located in each side of said two-sided guide means and extension, said ports being located in the first side in a facing relationship with the ports located in the second side of said guide means;

(d) means located in the vicinity of said 90° turn, said means restricting the flow of air into said ports by said vacuum means.

4,113,248

BASEBALL BAT MADE OF LIGHT ALLOY

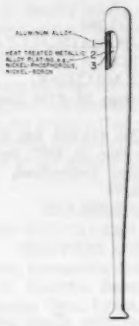
Seiichi Yanagioka, Hiratsuka, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Filed May 7, 1976, Ser. No. 684,351

Int. Cl.[2] **A63B** *59/06*

U.S. Cl. 273—72 A **3 Claims**

1. A baseball bat having a barrel portion and a handle portion comprised of an aluminum alloy having on its surface a heat treated metallic alloy plating selected from the group consisting of nickel-phosphorus and nickel-boron, said metallic plating having been heat treated at a temperature sufficient to



cause said plating to have a Vickers hardness in excess of about 550.

4,113,249

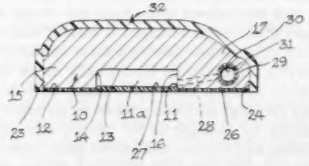
GOLF CLUB AND MANUFACTURE THEREOF

Peter W. Beery, Setauket, N.Y., assignor to Golf Resources, Ltd., Setauket, N.Y.

Continuation-in-part of Ser. No. 565,379, Apr. 7, 1975, abandoned. This application Jun. 6, 1977, Ser. No. 803,976

Int. Cl.[2] **A63B** *53/04*

U.S. Cl. 273—78 **9 Claims**



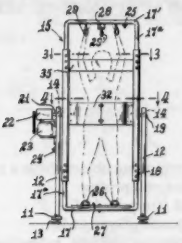
1. A golf club comprising an integral metallic body having toe, heel and flat impact face portions, said face portion having a central recess and the recess having downwardly extending side walls, a resilient and vibratory cover plate secured to said front wall and forming a sound resonating chamber with said recess, a hosel tube, said metallic body having an enlarged opening and in which said hosel tube at the inner end is mounted to form an amplification chamber therewith, a sound wave transmission chamber within said metallic body intermediate said sounding resonating and amplification chambers and communicating with each of said chambers, and a hollow shaft member mounted within and lying along said hosel tube and projecting therefrom whereby accurate top spin roll of the golf ball and characteristic feel and sound are effected on ball stroking by the club at the sweet spot and adjacent areas thereto of the cover plate.

8. A method for manufacturing golf clubs including the steps of die-casting a metallic body having toe, heel and flat impact face portions and having a recess in the face portion, making an internal bore in said die-cast body from the recess side wall and terminating in an enlarged opening made in said die-cast body, securing a vibratory plate over the face portion of the die-cast body forming a resonating chamber with the recess in said front face, securing a hosel member in said enlarged opening and securing a shaft member in said hosel member.

4,113,250
MOTORIZED INVERTING EXERCISER WITH BODY GUARD PERMITTING SELECTION OF DESIRED STRESS

Edward B. Davis, 115 Walnut Dr., St. Charles, Ill. 60174

Filed Jun. 18, 1976, Ser. No. 697,361
Int. Cl.[2] A63B 21/00
U.S. Cl. 272—93 19 Claims

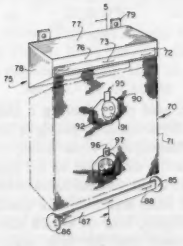


1. A theraputic apparatus for exercising the body of the user comprising (A) a substantially rectangular body frame journalled approximately midway between its longitudinal ends for 360° rotation on a horizontal axis, said body frame having a head end at one of its longitudinal ends and a foot end at the other of its longitudinal ends, supports for the feet of the user mounted at the foot end of the rectangular body frame, and means on the head end of said body frame engageable by the user to maintain his position in the body frame; (B) support framework means coupled to said body frame for rotationally supporting said body frame where journalled; (C) power means coupled to said body frame for rotating said body frame with uninterrupted motion of 360° about said axis; and (D) body support means coupled to said body frame for, at any position of said body frame about said axis, selectively reducing by any one of a plurality of different amounts the exertion required of the user to support the component of his body weight lying nonparallel to the longitudinal axis of his body while having a position in said body frame as said body frame rotates, one of said amounts being substantially zero, said body support means including a substantially circular enclosure with a diameter substantially larger than the body of a user to permit movement of the body in any lateral direction, said power means having the ability to rotate said body frame all of said 360° about said axis regardless of the position of the body of the user relative to said body support means.

4,113,251
TARGET GAME

Jack Imes, Jr., Chicago, Ill., assignor to RB Toy Development Co., Skokie, Ill.

Filed Dec. 22, 1976, Ser. No. 753,171
Int. Cl.[2] A63B 71/02
U.S. Cl. 273—95 R 11 Claims

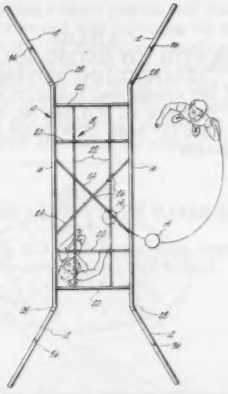


1. A game comprising a missile having at least a portion of its surface defined by a multitude of filamentary hook formations, a target adapted to be secured adjacent an upstanding support such as a vertical wall and composed of support means, and an open weave net having a thickness not greater than about ¼ millimeter connected to said support means and having a plurality of openings therein, at least some of said openings having at least one dimension not greater than about three millimeters and all of said openings having a dimension not less than about ¼ millimeters to engage said filamentary hook formations upon contact therewith, at least one target representation and means for positioning said target representation on the side of the net away from the thrower, said target representation being visible through said net, contact between said net and said hook formations causing engagement thereof sufficient to retain said missile in place to indicate the portion of said target struck thereby, said missile being removable from said target without tearing of same.

4,113,252
REBOUNDING BALL GAME

Ronald L. Darby, 1910 N. Kenmore, North Hollywood, Calif. 90027

Filed Jan. 28, 1977, Ser. No. 763,427
Int. Cl.[2] A63B 63/00, 69/00
U.S. Cl. 273—95 R 4 Claims



1. A rebounding ball game comprising a playing structure and means for supporting said structure above the heads of the players, said structure being comprised of a plurality of ball rebounding bars, two of said bars defining longitudinal end supports and others of said bars being disposed therebetween in substantially the same plane as said end supports and carried thereby such that said others of said bars intersect said end supports and each other in a plurality of different angles whereby upon directing a ball over said structure and upon said ball contacting said bars, said ball rebounds between said bars in different directions rapidly altering the path of the descent of said ball and thereby rendering more difficult the attempt to catch said ball prior to the ball striking the ground.

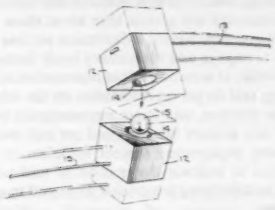
4,113,253
AMUSEMENT DEVICE REQUIRING CONCENTRATION AND COORDINATION

Henry H. Huston, Burlington, Vt., assignor to Weird Products Ltd., Vt.

Filed Mar. 4, 1977, Ser. No. 774,372
Int. Cl.[2] A63B 65/12
U.S. Cl. 273—96 R 14 Claims

1. An amusement device comprising an elongated normally straight rod of springy material with a receptacle for receiving

a ball or the like attached at one end and elongated handle means attached at the other end of the rod, said rod being substantially longer than said handle means and sufficiently flexible such that said rod and receptacle swing in oscillating



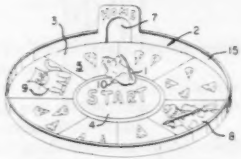
manner through angles in any direction relative to the axis of elongation of said handle, including up and down and from side to side, in response to slight movement imparted to said handle when gripped by the hand.

4,113,254

GAME WITH TOY HAVING ROTATING AND STRAIGHT-LINE MOVEMENT

Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055

Filed Feb. 11, 1977, Ser. No. 767,970
Int. Cl.[2] A63B *71/04*; A63H *29/20*
U.S. Cl. 273—108 **4 Claims**



1. A game which comprises a gameboard and a toy for use in conjunction with said gameboard, said gameboard comprising,

(a) a bottom surface, said bottom surface comprising a central start region and a plurality of sectors extending from said central start region and terminating at the perimeter of said bottom surface,

(b) a wall secured to said bottom surface and extending along the entire perimeter of said bottom surface said wall including an aperture therein extending to said bottom surface,

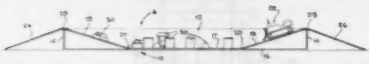
(c) a toy having a vertical cross-section at all points less than a vertical cross-section through said aperture, said toy comprising a body having skid means positioned for frictional engagement with said bottom surface and motor means within said body including a pair of wheels for engagement with said bottom surface, and means responsive to first predetermined rotational speeds of said wheels for causing only one of said wheels to lift off said bottom surface and cause said motor means to rotate in a circle about said skid means and responsive to second predetermined lower rotational speeds of said wheels for causing said motor means to travel in a substantially straight line, said toy being responsive to said straight travel, for movement towards said wall to stop in one of said sectors or to travel through said aperture in said wall.

4,113,255

TOY GAME FOR MOVING AN OBJECT UP AN INCLINED SURFACE

Adolph E. Goldfarb, 4614 Monarca Dr. Tarzana, Calif. 91356, Erwin Benkoe, 17965 Medley Dr., Encino, Calif. 91316, and Don Robinson, Manhattan Beach, Calif., assignors to Adolph E. Goldfarb, Tarzana, and Erwin Benkoe, Encino, both of Calif.

Filed Feb. 18, 1977, Ser. No. 770,186
Int. Cl.[2] A63B *67/00*; A63F *9/00*; A63H *17/04*
U.S. Cl. 273—108 **19 Claims**



1. A toy game for removing objects from a trough with a toy vehicle, said toy game comprising:

(a) a playing board comprised of

(1) a pair of opposed player ends,

(2) an upper playing surface extending between said player ends, said playing surface having an upwardly and outwardly inclined wall at each of said opposed player ends with a central trough therebetween,

(b) a plurality of score representing objects located on said playing surface,

(c) a self-propelled toy selectively positionable at a player end, said toy vehicle being operable to move down the inclined wall at such player end and to engage one of said objects and move the same up the inclined wall at the opposed player end to achieve a score, and

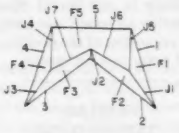
(d) a pair of ramps each connected to an inclined wall at one of the player ends and inclined downwardly and outwardly therefrom to enable an object moved up the inclined wall at a player end to be pushed by the vehicle down the associated ramp.

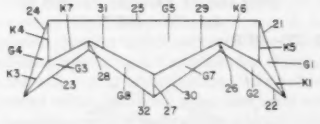
4,113,256

DUAL NATURE PUZZLE PIECES

David Roy Hutchings, R.R. 3, Box 149 S, Leander, Tex. 78641

Filed May 31, 1977, Ser. No. 802,253
Int. Cl.[2] A63F *9/12*
U.S. Cl. 273—160 **2 Claims**





1. A puzzle piece, said piece having a shape comprising a polyhedron defined by a concave polygon and five other surfaces, said polygon having five equal sides, two of which said sides are imposed on the diagonals to the opposite side in the polygon, each of said other five surfaces bordering a different one of the said five sides and together making five dihedral angles with said polygon, four of which said dihedral angles measure about 63° each and the fifth angle about half that measure, said fifth dihedral angle located opposite of said imposed sides, said puzzle piece able to be combined with

other pieces of the same configuration for the working of both tile-like puzzles or designs and three-dimensional puzzles.

4,113,257

GOLF PRACTICE DEVICE

Clinton D. Moffatt, 5610 Flagstone St., Long Beach, Calif. 90808

Filed Oct. 14, 1976, Ser. No. 732,318
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—185 C **4 Claims**

1. A golf practice device of the type that includes a base, an inverted L-shaped support that extends upwardly from said base, a rotatable member mounted on said support, a tethering cord secured to said rotatable member, a hollow resilient spherical shell that is a replica of a golf ball and is adapted to be hit with a golf club head, which shell has first and second diametrically aligned bores therein in which first and second resilient grommets are disposed through which a free end portion of said tethering cord extends, said golf practice device being characterized by including:

first and second fasteners on said tethering cord that are in abutting contact with said first and second grommets, with said first and second fasteners so longitudinally spaced on said tethering cord that said shell is diametrically compressed therebetween to circumferentially tension the portion of said shell that will be struck by said golf club head when said device is used for golf practice, with said shell when struck by said golf club head due to said tensioning, emitting a sound that is similar to the sound emitted by a real golf ball when impacted by a golf ball head, said shell having a plurality of circumferentially spaced openings therein adjacent one of said first or second grommets, with said opening serving the dual functions of creating sufficient wind resistance after said shell has been struck by a golf club head that said rotatable member, tethering cord and shell will stop rotating concurrently as a unit after a few turns, and said openings so weakening the portion of said shell in which they are formed that said shell may be diametrically compressed between said first and second fasteners.

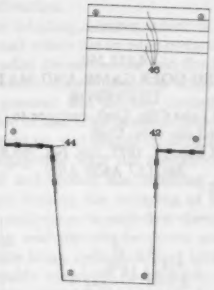
4,113,258

GOLFER'S CLUB SWING AND STANCE TRAINING DEVICE

Fiorenzo Midana, Corso Giovanni Agnelli 48, Turin, Italy

Filed Feb. 2, 1977, Ser. No. 764,816
Claims priority, application Italy, Dec. 20, 1976, 53717/76[U]
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 C **5 Claims**

1. A golfer's stance training device comprising a substantially flat member including first and second areas integrally connected at and extending respectively in opposite directions longitudinally from approximately the mid-region of the member, a plurality of longitudinally spaced laterally extending reference lines on said first area, a first longitudinally extending edge defining one side of said second area disposed substantially perpendicular to the transverse center line of the member, a second generally longitudinally extending edge spaced laterally from said first edge and diverging in relation thereto in the direction of said transverse center line defining the other side of said second area, third and fourth edges being provided extending parallel to the transverse center line of the member beginning at the juncture thereof with said first and second edges respectively and extending laterally outwardly therefrom, and a terminal edge of the member extending between said first and second edges to define one end of the member,



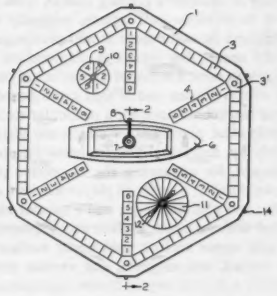
said second area defining a stance position such that the golfer standing astride said second area implanting his feet in a selected position such that the insteps respectively are adjacent said first and second edges and the toes of the shoes adjacent said third and fourth edges, and places the club to coincide with a selected one of the reference lines of said first area, whereby a natural free arrangement of the feet, body and hands is obtained while controlling the swing of the club.

4,113,259

BOARD GAME APPARATUS WITH WATER EJECTING DEVICE

Terry Michael Sands, 16 Ash, Belleville, Mich. 48111

Filed Nov. 29, 1976, Ser. No. 745,614
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—241 **9 Claims**



1. A competitive game apparatus, comprising:

a casing having disposed adjacent the top portion thereof a substantially flat game playing surface having a continuous peripheral path, said path being divided into playing spaces;

first means for ejecting water, said first means being operatively and rotatably connected to said game playing surface and disposed at the center of said game playing surface in a position to permit the ejected water to be directed toward a selected player;

second means for supplying water to said first means, said second means being disposed within said casing;

at least one switch mechanism disposed in said casing adjacent said game playing surface and operatively connected to said first means for permitting a player to eject water from said first means;

at least one movable playing token associated with each player for indicating the position of the player on said path; and

third means for randomly selecting the number of playing spaces that each of said tokens should be moved along said path.

4,113,260

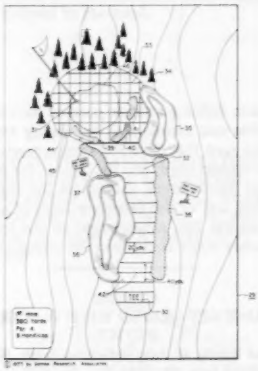
SIMULATED GOLF GAME AND MATERIALS THEREFOR

Paul E. Sain, Salt Lake City, Utah, assignor to Games Research Associates, Salt Lake City, Utah

Filed Feb. 17, 1977, Ser. No. 769,557

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—245 **4 Claims**



1. A golf game including in combination, plural game spendable each provided with indicia, defining a course including tee, rough, fairway, hazard, area-round-green, green, and hole areas, whereby to simulate a playing course, from tee to green and hole, of an outdoor golf course; mutually spaced grid markings disposed on said course at and proximate said green area; mutually spaced bar markings disposed on said course along said fairway area; a series of dice selected ones of which are rollable over a chosen one of said game boards for determining player marker advance for a particular stroke; a supply of means, individual pluralities of which are distributable to, and spendably by, individual players according to their individual handicaps, for advancing the respective players' play without stroke penalty; a series of player markers advanceable along said bar and grid markings; and a spinner-card having a card provided with an upper surface and a spinner pivoted to and above said upper surface, said upper surface being provided with hazard, not-on-green, and various stroke-number areas.

4,113,261

JAW BREAKER GAME

Anson Sims, Northridge, and Lawrence T. Jones, Playa Del Rey, both of Calif., assignors to Aurora Products Corporation, West Hempstead, N.Y.

Filed Sep. 16, 1976, Ser. No. 723,815

Int. Cl.[2] A63F *3/04*

U.S. Cl. 273—249 **12 Claims**

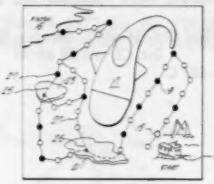
1. A game including a game board comprising:

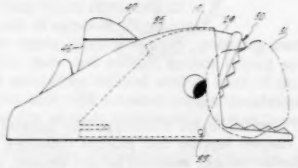
at least one game token;

a path of incremental progress on said game board from a point of shipwreck to shore;

means for randomly determining the amount of incremental advance of said token along said path;

a three-dimensional toy positionable on said game board, said toy including jaw means capable of receiving an inflated balloon and movable toward a closed position to





break said balloon and means for manually incrementally moving said jaw means toward a closed position, and

means associated with at least one portion of said path for directing a player to operate said jaw moving means to incrementally move said jaw means toward a closed position if said token lands on said portion.

4,113,262

RECORD SUPPORT AND ALIGNMENT APPARATUS FOR A VIDEO DISC PLAYER

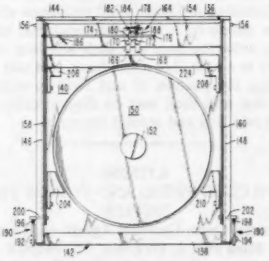
Ralph DeStephanis, Middlesex, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 31, 1977, Ser. No. 801,728

Claims priority, application United Kingdom, Dec. 20, 1976, 53175/76

Int. Cl.[2] G11B *23/04*

U.S. Cl. 274—9 B **9 Claims**



1. In a player for recovering prerecorded signals from a disc record removably subject to occupancy of a protective cover; said player including a housing having an input slot dimensioned to permit an insertion of a cover into said player and its removal therefrom; means aligned with said input slot for guiding said cover insertion and removal; a turntable rotatably mounted in said housing for supporting a record during playback; a platform mounted in said housing and disposed under said guide means for motion between an elevated position and a depressed position; means mounted in said player for protruding into a cover during arrival thereof at a fully inserted

position in said player; said protruding means being subject to operation in a first condition and a second condition; said protruding means, while disposed in said first condition, permitting cover arrival at said fully inserted position; said protruding means, while disposed in said second condition, precluding a removal from said player of a record during a cover withdrawal from said fully inserted position after an occupied cover arrival, whereby a record is retained in said player resting on said platform upon conclusion of said cover withdrawal; means for causing motion of said platform to said depressed position to effect a transfer of said retained record from said platform to said turntable; and means responsive to cover arrival at said fully inserted position in said player for alternating the condition of said protruding means between said first condition and said second condition; the improvement comprising:

record supporting means adapted for motion between a retracted condition and a depolyed condition;

said record supporting means being secured to said platform;

said record supporting means in said retracted condition allowing cover arrival at said fully inserted position in said player; and

said record supporting means in said deployed condition supporting a retained record such that, while said platform is disposed in said elevated position, said record is aligned with a cover resting on said guide means.

4,113,263

PHONOGRAPH RECORD PLAYER

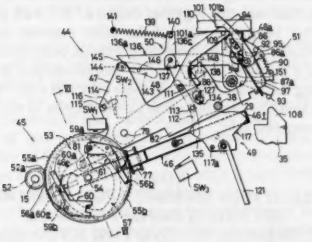
Kazuyuki Takizawa, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 9, 1976, Ser. No. 740,306

Claims priority, application Japan, Nov. 10, 1975, 50-135989

Int. Cl.² G11B *17/06*

U.S. Cl. 274—15 R **2 Claims**



1. In a phonograph record player having a rotatable turntable for supporting a phonograph record during the playing thereof, drive means for rotating said turntable, and a tone arm assembly including a tone arm carrying a pickup with a stylus to track the groove of a phonograph record on said turntable during a play operation and being mounted for lateral swinging across said turntable and for raising and lowering the tone arm relative to said turntable: a control mechanism operative in a lead-in mode for effecting lead-in movement of said tone arm from an elevated rest position outside the perimeter of said turntable to a selected set-down position of said stylus on a record supported by said turntable so as to commence a play operation, and in a return mode for effecting a return movement of said tone arm to said rest position upon the termination of said play operation, said control mechanism comprising

a drive gear rotatable by said drive means;

a control gear having a cam groove therein and being turned by said drive gear in said lead-in and return modes of operation;

a pivotally mounted main lever having a cam follower engaging said cam groove for effecting swinging movements of said main lever in first direction from a stop position to a play position and in a second direction back to said stop position in response to the turning of said control gear in said lead-in and return modes of operation, respectively;

a lead-in lever mounted for pivoting about an axis apart from the axis of swinging of the tone arm;

releasable coupling means for urging said lead-in lever to swing with said main lever in said first direction;

tone arm drive means for swinging said tone arm in the direction of said lead-in movement thereof in response to the swinging of said lead-in lever with said main lever in said first direction;

a record size selecting member which is turntable about a fixed axis and which has an edge comprised of portions at different radial distances from said fixed axis;

manually actuable control means for turning said record size selecting member and thereby operatively disposing a selected one of said edge portions thereof; and

abutment means on said lead-in lever defining an abutment surface engageable with the operatively disposed edge portion of said record size selecting member for correspondingly limiting the swinging of said lead-in lever with said main lever in said first direction and thereby determining said selected set-down position, said abutment surface being cylindrical and said abutment means being rotatably adjustable in respect to said lead-in lever about an axis which is eccentric in respect to said cylindrical abutment surface for finely adjusting said set-down position.

4,113,264

PHONOGRAPH RECORD PLAYER

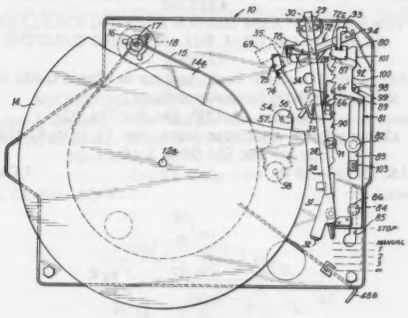
Toru Sato, Sagamihara; Shunji Tokumitsu, Tokyo; Masaaki Sakai, Kawasaki; Kazuhiko Kawasaki, Musashino; Kenichiro Kaimori, Zama, and Mitsuo Osawa, Fujisawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 765,374, Feb. 2, 1977, abandoned. This application May 19, 1977, Ser. No. 798,313

Claims priority, application Japan, Feb. 3, 1976, 51-9956

Int. Cl.² G11B *17/16*

U.S. Cl. 274—15 R **15 Claims**



1. In a phonograph record player having a rotatable turntable for supporting a phonograph record during the playing thereof, drive means for rotating said turntable, and a tone arm assembly including a tone arm carrying a pickup with a stylus to track the groove of a phonograph record on said turntable during a play operation and being mounted for lead-in movement of said tone arm from an elevated rest position outside the perimeter of said turntable to a selected set-down position of the stylus on a record supported by said turntable for commencement of a play operation and for return movement of said tone arm to said rest position upon the termination of a play operation: a control mechanism comprising

gear means selectively driven by said drive means;

trip means actuable at will and upon completion of each play

operation to cause a period of driving of said gear means by said drive means;

lever means driven by said gear means for urging said tone arm to automatically undergo said return movement and then said lead-in movement during respective portions of each period of driving of said gear means;

a mode selecting member manually movable to positions for selecting stop, manual and repeat modes of operation, respectively, of the record player;

latch means which is normally engaged with said mode selecting member in said position thereof for selecting said manual mode of operation, said latch means being operative when engaged to prevent said lead-in movement of the tone arm under the urging of said lever means;

means for causing operation of said drive means when said mode selecting member is in any one of said positions thereof for selecting the manual and repeat modes of operation, respectively;

means for disengaging said latch means in response to the disposition of said mode selecting member in each said position thereof for selecting a repeat mode of operation; and

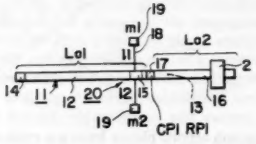
means responsive to driving of said gear means for temporarily disengaging said latch means in a concluding portion of each period of driving of the gear means following said portion thereof corresponding to the automatic lead-in movement of the tone arm so that, with said mode selecting member in the position thereof for selecting the manual mode of operation, said tone arm can then be manually lead-in from said rest position to a manually determined set-down position on the record.

4,113,265

TONE PICKUP ARM DEVICE KEEPING EXCELLENT DYNAMIC LATERAL BALANCE AND DAMPING EFFECT

Motoi Iyeta, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 11, 1977, Ser. No. 786,392
Claims priority, application Japan, Apr. 12, 1976, 51-41017
Int. Cl.[2] G11B *3/16*
U.S. Cl. 274—23 R **5 Claims**



1. A pickup arm device comprising:

a pickup arm;

a dynamic damper provided in said pickup arm to divide the pickup arm into a rear and a front part;

a fulcrum supporting said pickup arm and positioned at said rear part of the pickup arm;

a head shell provided on one end of said front part of the pickup arm remote from said damper; and

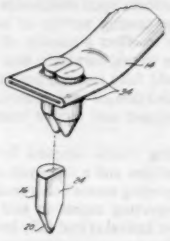
a dynamic lateral balancer provided on said front part of the pick arm but spaced from said damper and located closer to said fulcrum than is said head shell on said front part.

4,113,266

PLAYBACK STYLUS FOR PHONOGRAPH RECORD STAMPER

George Alexandrovich, Commack, N.Y., assignor to Pickering & Company, Inc., Plainview, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,391
Int. Cl.[2] G11B *3/02, 3/44*
U.S. Cl. 274—37 **4 Claims**



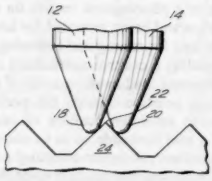
1. A stylus assembly for tracking a phonograph record stamper or matrix comprising: a first elongated member having a longitudinally extending body portion terminating at one end in a pointed tip having diametrically opposed edges contoured to engage a phonograph record; a first flat surface extending longitudinally along substantially the entire length of said first member; a second elongated member having a longitudinally extending body portion terminating at one end in a pointed tip having diametrically opposed edges contoured to engage a phonograph record; a second flat surface extending longitudinally along substantially the entire length of said second member; means bonding said first member and said second member to each other along said flat surfaces with said members aligned so that said tips together define a "V" with an edge of one member facing an edge of the other member so that the stylus assembly can simultaneously engage both sides defining a ridge of a stamper or matrix, an elongated tube, and means for bonding the ends of said members opposite said "V" to said tube with said tips defining a line perpendicular to the direction of said elongated tube.

4,113,267

DOUBLE STYLUS ASSEMBLY FOR PHONOGRAPH RECORD STAMPER PLAYBACK

Roland C. Wittenberg, New Hyde Park, N.Y., assignor to Pickering & Company, Inc., Plainview, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,397
Int. Cl.[2] G11B *3/02, 3/44*
U.S. Cl. 274—37 **3 Claims**



1. A stylus assembly for tracking a phonograph record stamper or matrix having raised ridges having information comprising:

a first stylus member having a longitudinally extending body portion terminating at one end in a pointed tip and having a record engaging edge;

a second stylus member having a longitudinally extending

body portion terminating at one end in a pointed tip and having a record engaging edge;

an elongated tube; the ends of said first and second styli members opposite said tips being bonded to said tube, said tips defining a line angled to said tube axis at an angle other than zero; and,

said first and second styli members being bonded to one another generally in the form of an inverted "V" and oriented so that said tips are aligned to engage the ridges from opposite sides offset from one another in the direction along the direction of tube elongation.

4,113,268

EXTENDED TEMPERATURE RANGE VALVE SEAL

Kenneth C. Simmons, Plainfield, Conn.; Harry C. Champlin, Jr., Ashaway, R.I.; Carl F. Livorsi, Holbrook, Mass., and Joseph A. Wucik, Jr., Westerly, R.I., assignors to Posi-Seal International, Inc., North Stonington, Conn.

Continuation-in-part of Ser. No. 777,644, Mar. 15, 1977, abandoned. This application May 18, 1977, Ser. No. 797,921

Int. Cl.[2] F16J *15/34*

U.S. Cl. 277—168 **7 Claims**

1. A seal ring for use as an extended-temperature range valve seat, the seal ring having a hard metal body formed with

a cylindrical shoulder portion, the shoulder portion being defined by a circumferential front surface, an opposed circumferential rear surface, and two ends,

a pair of circumferential flanges extending from the rear surface of the shoulder at each of the respective ends, each flange having a circumferential edge spaced radially from the rear surface of the shoulder portion,

a circumferential rib extending from the front face of the shoulder portion intermediate the ends and terminating in a circumferential seating surface, the width of the rib being less than the distance between said ends of the shoulder portion,

the seal ring being adapted to fit within an undercut circumferential groove in a seating region of a valve, such groove having substantially parallel sides spaced apart by a distance greater than the distance between the ends of the shoulder portion of the ring and an opening narrower than the distance between the sides of such groove, and the rib of the seal ring being adapted to extend through such a groove opening for movable mating engagement of the rib seating surface with a complementary sealing surface of such a valve, wherein the improvement comprises:

a circumferential groove being formed in the seating surface of said rib, the groove having an opening narrower than the width of an interior portion thereof and

a seat ring of material softer than the metal of the seal ring, the seat ring fitting tightly within the groove in the rib and extending through the opening of the groove in the rib and beyond the rib seating surface to terminate in a primary valve seat surface, said primary valve seat surface of said seat ring being adapted to provide the only sealing engagement with such a complementary valve sealing surface unless the temperature inside such valve exceeds the destruction temperature of the seat ring material.

4,113,269

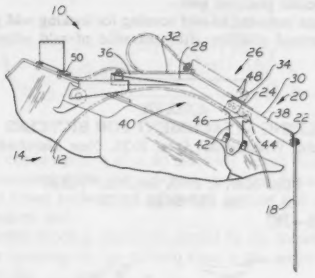
FENDER

Warner G. Richardson, and Eugene M. Wilson, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 22, 1977, Ser. No. 826,576

Int. Cl.[2] B62B *9/14*

U.S. Cl. 280—154.5 R **5 Claims**



1. A composite, movable fender portion comprising:

a first assembly having a surface and first and second end portions;

a second assembly having a working member and being connected to the first assembly and movable relative to the first assembly between a first position at which the working member is spaced from the first assembly and a second position at which the working member is supported by the surface of the first assembly; and

means for maintaining the second assembly in a selected one of the first and second positions,

said maintaining means including a stationary support bracket having an opening, and a pin insertable in said opening, said opening being alignable with an opening in the second assembly at the first position of said second assembly, said support bracket supporting the second assembly through said pin and said openings at only the first position and continuously supporting the first assembly.

4,113,270

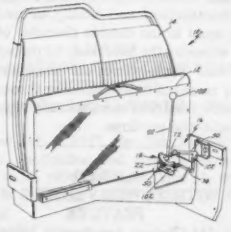
WHEELCHAIR RETAINER MECHANISM

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Filed Mar. 4, 1977, Ser. No. 774,528

Int. Cl. B60p *7/00*

U.S. Cl. 280—179 R **18 Claims**



1. A wheelchair retainer attachable to the interior of a vehicle for retaining a wheelchair in a fixed position during vehicle movement, comprising:

a housing attachable to the interior of the vehicle and having an outwardly opening mouth dimensioned to receive a wheelchair wheel;

a pair of jaws, each pivotally mounted to said housing for movement from a first position permitting entrance of a wheelchair wheel into said housing to a second position closing the mouth of the housing and thereby retaining said wheel;

means slidably mounted on said housing independent of said jaws and engaged by an entering wheelchair wheel for engaging and pivoting said jaws from said first position to said second position; and

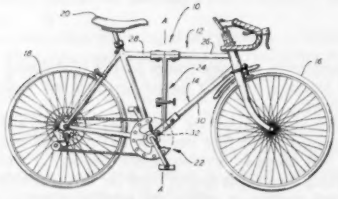
lock means mounted to said housing for locking said jaws in said second position after entrance of said wheelchair wheel.

4,113,271

FOLDING ATTACHMENT FOR BICYCLES

Arnold Furia, Wedgewood Apts. E-35, New Hartford, N.Y. 13413

Filed Mar. 4, 1977, Ser. No. 774,526
Int. Cl.[2] B62K *15/00*
U.S. Cl. 280—287 **4 Claims**



1. An attachment for converting a standard bicycle to a foldable bicycle by cutting the upper, horizontal, tubular frame member and the lower, diagonal, tubular frame member in a plane parallel to the wheel axes, thereby providing separate front and rear portions each having upper and lower frame end portions, said attachment comprising:

(a) first and second elongated, flat connecting bars each having a length substantially equal to the distance between said upper and lower frame end portions;

(b) hinge means connecting said bars to one another for relative movement about an axis parallel to the length thereof and spaced laterally therefrom;

(c) first and second semi-cylindrical members extending rigidly from the upper ends of said first and second bars, respectively, along axes perpendicular to the length thereof;

(d) third and fourth semi-cylindrical members extending rigidly from the lower ends of said first and second bars, respectively, along axes arranged at an angle with respect to the length of said bars equal to the angle of the axis of said diagonal frame member with the vertical; and

(e) each of said semi-cylindrical members having at least one opening therethrough and having an inside diameter substantially equal to the outside diameter of said frame end portions, whereby the latter may be placed in contact with each of said semi-cylindrical members and attached thereto by means of bolts extending through said openings in said semi-cylindrical members and registering openings in said frame end portions.

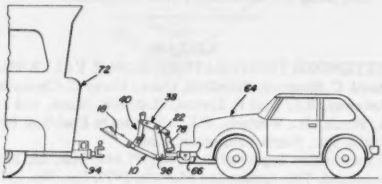
4,113,272

TOW BAR WITH TOWED VEHICLE SUSPENSION FEATURE

Carl M. Sebby, 211 Chateau Apartments, Minot, N. Dak. 58701

Filed Jul. 5, 1977, Ser. No. 812,896
Int. Cl.[2] B62D *53/04*
U.S. Cl. 280—402 **15 Claims**

1. An elongated tow bar construction including first front and second rear generally horizontal elongated tow bar arm sections joined together at one pair of corresponding end portions in generally end aligned relation and for relative angular displacement about a horizontal transverse axis, the free end of one of said sections remote from the other section including first means adapted to be connected to a towing vehicle by an articulated connection, the free end of said other section remote from said one section including second means for fixed attachment to a towed vehicle, and third means operatively connected between said arm sections to forcibly effect relative angular displacement of said arm sections to depress said free ends relative to said one pair of ends thereof, said



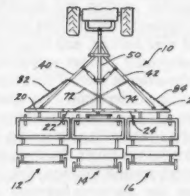
third means including rigid upstanding members carried by said first and second arm sections and spaced apart along said elongated tow bar construction, articulated connecting link means interconnected between upper portions of said upstanding members for angular displacement relative thereto, and force means interconnected between said connecting link means and one of said arm sections for angularly displacing said link means relative to said upstanding members whereby to force the upper end portions of said upstanding members apart.

4,113,273

MULTIPLE IMPLEMENT FOLDING HITCH

Michael Gates, Lansford, N. Dak. 58750

Filed Jul. 7, 1977, Ser. No. 813,517
Int. Cl.[2] B60D *1/14*
U.S. Cl. 280—413 **7 Claims**



1. A multiple implement folding hitch, comprising,

a first normally transversely extending and substantially horizontally disposed frame means comprised of a plurality of frame members pivotally connected together about vertical axes in an end-to-end relationship, said frame means being movable from the transversely extending field position to a folded transport position, said first frame means adapted to have at least a pair of trailing implements operatively connected thereto,

a first longitudinally extending and substantially horizontally disposed tubular frame means extending forwardly from the center of said first frame means for operative connection to a prime mover,

a first elongated member operatively pivotally connected at its forward end to said first tubular frame means adjacent the forward end thereof and extending rearwardly and outwardly therefrom and being operatively pivotally connected to said first frame means adjacent one outer end thereof,

a second elongated member operatively pivotally connected at its forward end to said first tubular frame means adja-

cent the forward end thereof and extending rearwardly and outwardly therefrom and being operatively pivotally connected to said first frame means adjacent the other outer end thereof,

a second tubular frame means selectively telescopically mounted in said first tubular frame means adapted to have at least a third trailing implement connected thereto between the said pair of trailing implements when said first frame means is in its field position, said second tubular frame means adapted to be slidably moved rearwardly with respect to said first tubular frame means to permit the said third trailing implement connected thereto to be positioned rearwardly of the said pair of implements when said first frame means is moved to its folded transport position,

and means for maintaining said first frame means in said field and transport position.

4,113,274

PNEUMATIC LIFT FOR SINGLE AXLE TRAILER

Oscar Oswald Vahrenkamp, 317 Sparks Dr., Grand Prairie, Tex. 75050

Filed Nov. 22, 1976, Ser. No. 743,607
Int. Cl.[2] B60D *1/14*
U.S. Cl. 280—475 **8 Claims**

7. In a portable utility trailer assembly of the type including a frame supported by a single axle and having a tongue assembly including a hitch and coupling pin projecting from the frame for hookup to a tow truck, the combination with the trailer assembly of:

a pneumatic jack assembly and a source of compressed air operably connected thereto for assisting an operator in lifting the tongue to engage a hitch receptacle on the tow truck, the jack assembly including a ground engaging strut pivotally secured to the tongue, a pneumatic power transducer having a pressure chamber connected to receive compressed air from the compressed air source and an actuating arm operably coupled to the pressure chamber for transmitting a mechanical force in response to power derived from the compressed air in the pressure chamber, the power transducer being pivotally secured to the tongue and the actuating arm being pivotally secured to the strut to permit rotational movement of the power transducer and tongue relative to each other and relative to the strut as the tongue is lifted by the force exerted by the power transducer through the actuating arm;

a spring having an end portion secured to the tongue and an opposite end portion secured to the strut, the spring being stretched by the movement of the tongue relative to the strut when the actuating arm is extended, the stretched spring applying a recoiling force to retract the strut and actuating arm when the pressure chamber is de-energized; and,

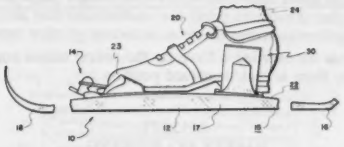
a latch having a first end portion for confining the coupling pin in registration with the hitch and coupling member and having a second end portion for engaging the strut, the latch being pivotally secured to the tongue and rotatable to a first position to permit access to the coupling pin when the strut and actuating arm are extended, and being rotatable to a second position wherein the coupling pin is confined by the first end portion and the second end portion is confined by the strut when the strut and actuating arm are fully retracted.

4,113,275

SKI BOOT HEEL RESTRAINING APPARATUS

William Claude Sherwin, Salt Lake City, Utah, assignor to Nortec Inc., Salt Lake City, Utah

Filed Oct. 12, 1976, Ser. No. 731,558
Int. Cl.[2] A63C *9/18*
U.S. Cl. 280—615 **10 Claims**



1. In combination with a ski assembly which comprises:

an elongated ski having an upper surface and a snow engaging lower surface and a forward portion and a rearward portion, and

a suitable binding apparatus carried by the forward portion for securing the toe of a ski boot to the upper surface of the ski,

the improvement of a ski boot heel restraining means carried by the ski, the heel restraining means comprising:

a base plate secured to the top surface of the ski by any suitable means:

at least one continuous member disposed upon the base plate comprising:

a pair of side portions thereof extending generally vertically from the base plate and disposed apart from each other so as to define a space therebetween to loosely accept the heel of the boot, and

a generally horizontal resilient center portion spanning the space between the vertical portions generally at the lower ends thereof, said center portion being curved upwardly away from the base plate, so that the weight of an operator of the ski acting through the heel upon the resilient raised center portion causes the center portion to lower toward the base plate and the vertical portions of the member to rotate toward the center of the ski so as to grip the heel and to prevent lateral movement thereof and so that the heel is released when subsequently raised from the center portion; and

means loosely securing the member to the base plate so that the member is centrally disposed laterally in respect to the ski and the said space is oriented transverse to the ski, said means permitting substantially unimpeded displacement of the center portion of the member a suitable amount upwardly and downwardly and permitting also unimpeded rotation of the vertical portions inwardly and outwardly in respect to the ski.

4,113,276

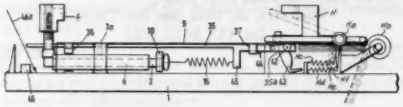
SKI BINDING AUTOMATICALLY RELEASABLE BY OVERSTRESS

Bernhard Kirsch, Im Litzelholz 23, 5500 Trier-Biewer, Fed. Rep. of Germany

Filed Jan. 3, 1977, Ser. No. 756,469
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559271; Feb. 6, 1976, 2604513; Apr. 10, 1976, 2615806
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—616 **31 Claims**

1. In a ski binding including a toe clip and swivel means mounting the clip for swiveling about an axis extending longitudinally of a ski, the improvement comprising guide means guiding the swivel means for movement lengthwise of the ski between a rearward position in which the toe clip is engaged with a ski boot sole in retaining relationship and a forward position in which the toe clip is swivelable into sole-released

position, mounting means supporting said guide means for movement transversely of the ski, and resilient force-producing means for exerting a force on the swivel means normally retaining them in their rearward position.



4,113,277

SAFETY SKI BINDING

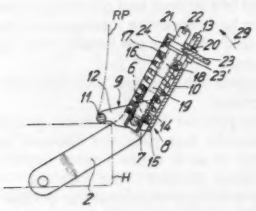
Reinhold Zoor, Dachau, Fed. Rep. of Germany, assignor to Heinrich Wunder KG, Fed. Rep. of Germany

Filed Nov. 26, 1976, Ser. No. 746,185

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1975, 2553886; Feb. 28, 1976, 2608322

Int. Cl. A63c 9/08

U.S. Cl. 280—626 **20 Claims**



1. In a safety ski binding, a combination comprising a yoke which is pivotable with respect to the ski about an axis extending transversely of the skiing direction; pivot means provided in said yoke and extending in substantial parallelism with said axis; a lever movable about and in a direction substantially transversely of said pivot means, said lever having a shorter first arm constituting a holding-down device movable to and from an operative position of engagement with the heel of a ski boot or the like and a longer second arm; disengageable coupling means for normally maintaining said device in operative position, including a first coupling element provided on said second arm and a second coupling element on said yoke, said first element being movable relative to said second element from a first position of engagement with to a second position of disengagement from said second element; and means for biasing said first coupling element to said first position to thus determine the magnitude of that force which is required to move said first element to said second position, said biasing means being disposed behind said pivot means, as considered in the skiing direction.

4,113,278

ACCESSORY KIT AND METHOD FOR PROVIDING SUPPLEMENTAL ANTI-SWAY CONTROL FOR AUTOMOTIVE VEHICLES

C. Glen Rissberger, 5055 SW. Elm, Beaverton, Oreg. 97005

Filed May 17, 1977, Ser. No. 797,740

Int. Cl. B60g 11/20

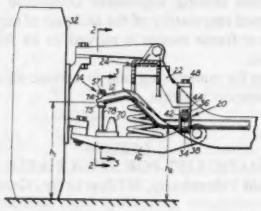
U.S. Cl. 280—689 **4 Claims**

1. An accessory kit, connectable to the pair of steering idler arm mounts and to the A-arms on the undercarriage at the front wheels of an automotive vehicle, for providing supplementary anti-sway control at the front wheels thereof, said accessory kit comprising:

(a) an elongate bar having length sufficient to extend from a first lower A-arm of said vehicle to an opposing lower A-arm thereof and a configuration closely approximating the respective planes of the undercarriage of said vehicle intermediate said A-arms, said bar having an aperture formed in each of the ends thereof;

(b) a pair of bushings each composed of elastomeric material and having an aperture formed therein for closely receiving the respective ends of said bar therethrough;

(c) a pair of brackets each having an upper portion and a lower portion, said portions defining a space therebetween for closely receiving a respective one of said bushing pair



therein, said upper bracket portions each having a aperture formed therein suitable for receiving fastener means therethrough for securing said upper bracket portion to a respective one of said steering idler arm mounts;

(d) means for securing each of said lower bracket portions to its respective upper portion so as to lockingly engage said bushing therebetween; and

(e) a pair of fastener means comprised of elastomeric material for resiliently securing said respective rod ends to said respective A-arms.

4,113,279

HYDROPNEUMATIC SPRING ELEMENT

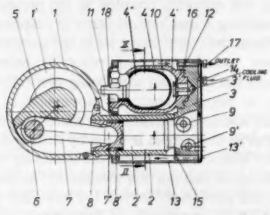
Helmut Hausenblas, Kassel-Ki., and Hans-Erich Holzforster, Fuldatal, both of Fed. Rep. of Germany, assignors to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Jun. 2, 1976, Ser. No. 691,978

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1975, 2525493

Int. Cl.² B60G 3/12

U.S. Cl. 280—705 **6 Claims**



1. A hydropneumatic spring element, especially for use in connection with land vehicles, especially vehicles of the track laying type, which includes in combination: a crank case, cylinder-piston means connected to said crank case, girder means with first and second portions, hydraulic fluid storage means having an interior, said girder means having the first portion connecting one end of said cylinder-piston means and having said hydraulic fluid storage means connected to the second portion of said girder means, damping valve means supported by said girder means adjacent said cylinder-piston means including a cylinder with an interior and a piston, first conduit means adapted to be connected to a source of cooling fluid and leading to the interior of the cylinder of said cylinder-

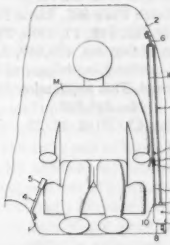
piston means and to the interior of said fluid storage means, rocker means rotatably journalled in said crank case for connection with a wheel rocker outside said crank case, a connecting rod with a crank pin at one end thereof pivotally connected to said rocker means, said connecting rod having another end portion pivotally connected to the piston of said cylinder piston means, a container made of elastomeric material arranged within said fluid storage means and provided with inlet valve means for connection with a source of gaseous medium and for conveying the gaseous medium into said container, a cooling jacket surrounding said girder means and said cylinder-piston means and said fluid storage means, and having an outlet and including second conduit means having an inlet connectable to a source of cooling liquid and communicating with the interior of said cooling jacket for conveying cooling liquid along the outer walls initially along said girder means and thereafter along said cylinder piston means and along said fluid storage means through said outlet.

4,113,280

SEAT BELT DEVICE FOR USE IN VEHICLE

Hiroshi Arai, Ohbu, and Mamoru Mori, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 3, 1977, Ser. No. 765,392
Claims priority, application Japan, Feb. 19, 1976, 51-18751[U]
Int. Cl.[2] A62B *35/00*; B60R *21/10*
U.S. Cl. 280—747 **4 Claims**



1. A seat belt device for use in a vehicle in which a belt is strung in a loop fashion so as to hold an occupant of a seat of the vehicle by a shoulder belt portion and a lap belt portion of the belt, and a part of the belt is wound on a shaft of a single retractor wherein the ends of said shoulder belt and said lap belt portions are coupled together by being overlapped one on the other to form a coupling portion of greater thickness than said shoulder belt portion, and wherein a tongue plate, having a slit which is wider than the thickness of said shoulder belt portion and narrower that the thickness of said coupling portion, is provided on the shoulder belt portion of the belt, said coupling portion acting as a stopper preventing the tongue plate from slipping down the belt when not in use.

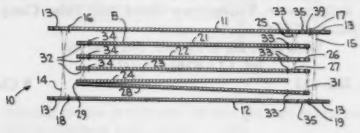
4,113,281

CONTINUOUS BUSINESS FORMS ASSEMBLY

Per Weien Halse, Oslo, Norway, assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 727,518, Sep. 28, 1976. This application Aug. 2, 1977, Ser. No. 821,223
Int. Cl.[2] B41L *1/20*
U.S. Cl. 282—11.5 A **3 Claims**

1. A series-connected business form adapted to be fed through the printing means of a business machine, comprising a continuous pair of superimposed outer webs, said webs each having a row of spaced feed holes extending along at least one marginal edge thereof in superimposed relationship and being arranged to engage the feed means of the business machine so that the business form is thereby advanced into and past the printing means, said outer webs being attached together by first securement means adjacent said superimposed holes, at least one intermediate web lying between said outer webs and having one marginal edge thereof spaced inwardly of said superimposed feed holes, said outer webs having spaced transverse lines of weakening in superimposed relationship, said intermediate web having cut portions presenting opposite edges spaced inwardly of said transverse lines of weakening, said form being separable into individual units along said transverse lines, said intermediate web being attached to only one of said outer webs by second securement means extending longitudinally of the form, and said one of said outer webs having a first longitudinal line of weakening thereon located between said first and second securement means, whereby upon the printing of a number of said units, the next to the last of said units so printed may be separated along said transverse lines of weakening whereafter said one of said outer webs and said intermediate web attached thereto of the last of said printed units may be separated from the other of said outer webs thereof to thereby leave said other web of said last unit available as a drive web for initiating the feed of the remaining units to be printed through the printing means.



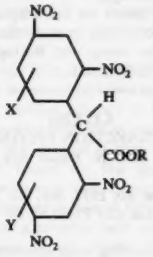
4,113,282

PRESSURE-SENSITIVE CARBONLESS COPY SYSTEM AND TRANSFER SHEET FOR USE THEREIN

Sydney Martin Spatz, Circleville, Ohio, and Dale Richard Shackle, Scottsboro, Ala., assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 10, 1977, Ser. No. 767,543
Int. Cl.[2] B41M *5/16, 5/22*
U.S. Cl. 282—27.5 **15 Claims**

1. A pressure-sensitive carbonless copy system comprising a transfer sheet and a developer sheet, said transfer sheet comprising a paper substrate having a plurality of surfaces and having applied thereto on at least one of said surfaces microcapsules containing a solution of a color precursor in a carrier liquid, said carrier liquid being an oil immiscible with water, said color precursor having the following formula:



wherein R is selected from the group consisting of a C_1 to C_4 alkyl, methoxymethyl, methoxyethyl, ethoxymethyl and C_1 to C_4 chloroalkyl and X and Y are separately selected from the group consisting of hydrogen, a halogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy and C_1 to C_4 chloroalkyl, and said developer sheet being a paper substrate having a plurality of surfaces and having applied thereto on one of said surfaces an alkaline color developer selected from the group consisting of the hydroxides of sodium, potassium and lithium and ethylenediamine, dieth-

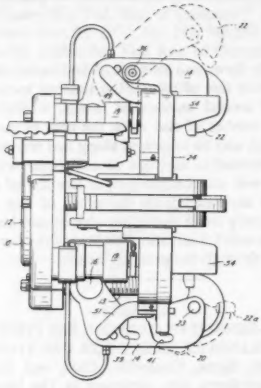
ylenetriamine, triethylenetetramine, tetraethylenepentamine, trimethylenediamine, N-methylethylenediamine, N-ethylethylenediamine, tetramethylenediamine, N-(2-hydroxyethyl)ethylenediamine, 1,8-bis-(dimethylamino)naphthalene, butylamine, piperidine, pyrrolidine, ethanolamine, N-methylguanidine, N-methylpiperidine, N-phenylguanidine, ethylamine, ethylpyrrolidine, xanthine and mixtures thereof.

4,113,283

PIPE COUPLER FOR VARIOUS SIZE FLANGES

William M. Curtis, and Dean E. Hermanson, both of Garland, Tex., assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed Apr. 26, 1977, Ser. No. 790,963
Int. Cl.² F16L *23/00*
U.S. Cl. 285—12 **9 Claims**



1. A coupler comprising,
a body having a flowway therethrough,
a plurality of clamp arms each having cam slot means therein,
pivot means mounting each arm on the body for swinging movement about the pivot,
means for moving said pivot means along the body,
an adapter ring having a flowway therethrough,
means releasably mounting said adapter ring on the body,
means sealing between the body and adapter ring about the flowways therethrough,
and cam follower means on the adapter ring cooperating with the cam slot means in each clamp arm controlling movement of the clamp arm during movement of the pivot means along the body.

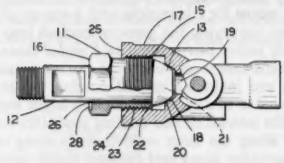
4,113,284

CONNECTION FITTING

William C. Blocker, 1406 N. Butler Ave., Indianapolis, Ind. 46218

Filed Mar. 30, 1977, Ser. No. 783,054
Int. Cl.² F16L *55/00*
U.S. Cl. 285—14 **9 Claims**

1. A fitting for connecting to an aperture of a container of a system whereby a substance is transferable in either direction through said fitting, which comprises:
a hollow cylinder having a first end and a second end, said first end being externally threaded and adapted to be received in the aperture;
a stem member having a bore extending therethrough and an enlarged head portion at its first end, said stem member being longer than said cylinder and slidably extending therethrough and extending out from either end of said cylinder, said head portion adapted to abut said first end of said hollow cylinder when said cylinder is received in the aperture;
first means between the first and second end of said cylinder operable to provide an escape path of least resistance to any leaks occurring between said head portion and a corresponding aperture in a container into which said



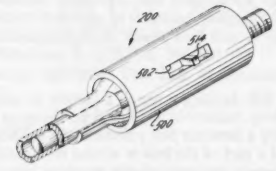
fitting is placed, said head portion being designed to substantially close off said aperture by interfacing therewith; and
second means for the retention of leak-test solution, said means includes a recessed area at the second end of said hollow cylinder and adjacent to the point of exit to the atmosphere of said first means.

4,113,285

CLAMPING DEVICE

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

Division of Ser. No. 658,582, Feb. 17, 1976, Pat. No. 4,062,573, which is a division of Ser. No. 479,667, Jun. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 427,149, Dec. 21, 1973, abandoned. This application Jul. 28, 1977, Ser. No. 819,819
Int. Cl.² F16L *33/22*
U.S. Cl. 285—45 **5 Claims**



1. A clamping member for attaching one part of a two part hose coupling device to a hose, comprising, in combination, a body section having a bore running therethrough, and comprising a first end portion, an intermediate portion and a second end portion, said first end portion being adapted to be connected to one part of a two part hose coupling device; at least a pair of spaced apart clamping rods each pivotally connected to said body section of said clamping member, each of said clamping rods including a clamp section connected at one end of said rod; rod moving means comprising a ring member disposed about said body section in contact with said clamping rods and which moves axially with respect to said body section and said clamping rods, said rod moving means further including at least a pair of spaced apart projections extending therefrom, a protective cover having at least a pair of spaced apart elongated slots which extend axially of said cover, said cover being disposed over said body portion of said clamping member in a manner such that said projections of said rod moving means protrude through said slots, and further including an inner sleeve member disposed within said bore of said body section of said clamping member, in a manner such that when a hose section is fitted within said clamping member, a portion of said hose is disposed over at least a portion of said inner sleeve member and said rod moving means can be positioned

so as to force said connecting rods to be pivoted downwardly so that the clamp sections thereof will be forced against said hose and thereby hold said hose in place in said body section and in communication with said one part of said coupling device.

4,113,286

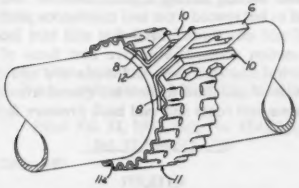
HANGER FOR PIPE

Harold Kennedy, Jr., Birmingham, Ala., assignor to United States Pipe and Foundry Company, Birmingham, Ala.

Continuation-in-part of Ser. No. 724,061, Sep. 17, 1976, abandoned. This application Dec. 1, 1977, Ser. No. 856,384

Int. Cl.[2] F16L *3/00*

U.S. Cl. 285—61 **5 Claims**



1. In combination, a pair of plain end pipes arranged in end to end relationship and generally horizontal, a sleeve type resilient gasket completely surrounding the abutting pipe ends, a metal band substantially surrounding said resilient gasket, said metal band having free ends and each free end having an upwardly extending portion, a hanger strip adapted to be clamped between said upwardly extending portions of said free ends, said hanger strip having a central upright leg with an upper and lower end and a pair of legs with one end of each leg extending upwardly adjacent said central upright leg and the other end of each of said pair of legs extending outwardly in an opposite and downwardly arcuate direction forming an arc underneath said free ends of said metal band and the lower end of said central upright leg extending interiorly of the arc formed by said other ends of said pair of legs, and means for clamping said hanger strip between said free ends of said metal band whereby the lower end of said central upright leg compresses said resilient gasket more than does said metal band.

4,113,287

END FITTING FOR MULTI-CHANNEL HOSE

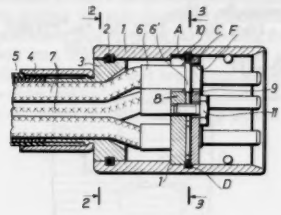
Nikolai Tikhonovich Bogatirev; Jevgeny Grigorievich Filianovich; Alexandr Dmitrievich Ignatyev; Alexandr Nikolaevich Merkulov; Jury Filippovich Ponomarenko; Jury Gheorghievich Shein, all of Moscow, U.S.S.R.; József Basó, Budapest, Hungary; Béla Frituz, Budapest, Hungary; József Korbuly, Budapest, Hungary; Sándor Nagy, Budapest, Hungary; Sándor Mikes, Szeged, Hungary, and Zsolt Pap, Budapest, Hungary, assignors to Banyaszati Kutato Intezet, Budapest, Hungary; Skotchinksy Institut Gornogo Dela, Moscow, U.S.S.R. and Taurus Gumiipari Vallalat, Budapest, Hungary

Filed Apr. 14, 1977, Ser. No. 787,511

Int. Cl.[2] F16L *39/00*

U.S. Cl. 285—137 R **5 Claims**

1. An end fitting for a multi-channel hose, comprising a hollow body for positioning and retaining coupling elements of individual hoses; a positioning plate and a guiding plate respectively disposed within said body, at right angles to the longitudinal axis of the end fitting; respective apertures defined in said plates for receiving said coupling elements; adjusting means for varying the axial distance between said plates; and means disposed between said plates for resiliently spacing them apart, at least a part of said spacing means being farther from the longitudinal axis, when said plates are pulled towards each other under load, than in an unloaded state; wherein a groove is defined in the internal surface of said body, and said part of



the spacing means is engaged in said groove when said plates are pulled towards each other.

4,113,288

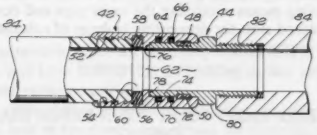
SWIVEL COUPLING

Donald E. Cox, Rolling Hills Estates, Calif., assignor to Coxwells, Incorporated, Los Angeles, Calif.

Filed Dec. 6, 1976, Ser. No. 747,660

Int. Cl.[2] F16L *27/08*

U.S. Cl. 285—174 **4 Claims**



1. A coupling for connecting a tank for receiving or dispensing fluid with a hose having a circular inner cross section comprising:

a first mating member adapted to be securely connected to the tank, said first mating member having an inner hollow portion having a uniform circular cross section with the inside diameter equal to the inside diameter of the hose and adapted to transmit fluid therethrough, said first mating member further having a circumferential recess on the outer surface thereof;

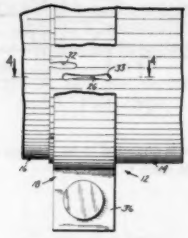
a ring of nylon like material adapted to be fitted in said circumferential recess of said first mating member; and

a second mating member adapted to be rotatably coupled with said first mating member at one end with the hose at a second end, said second mating member including a circumferential recess on the inner surface thereof adapted to receive said ring to provide a rotatable mechanical coupling between said first mating member and said second mating member, said second mating member further including O-ring means mounted in grooves within the inner surface thereof for communicating with a portion of the outer surface of said first mating member to provide a fluid seal, said second mating member having a portion with an inner hollow surface for communicating with the fluid and having a circular inner cross sectional configuration which is identical to the circular cross sectional configuration of said inner hollow portion of said first mating member to provide an unobstructed flow path for fluid transmitted through said first and second mating members and the hose.

4,113,289
EXHAUST SYSTEM AND MUFFLER LAP JOINT

Wayne M. Wagner, Apple Valley, and John A. Campbell, Minneapolis, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Mar. 3, 1977, Ser. No. 773,847
Int. Cl.[2] F16L *21/06*
U.S. Cl. 285—322 13 Claims

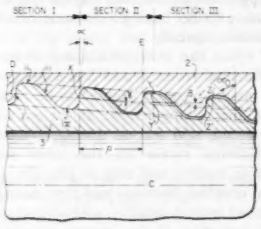


1. An exhaust conduit lap joint comprising, in combination:
   a. an inner exhaust pipe having an end portion including a tubular wall;
   b. an outer exhaust pipe having an end portion including a tubular wall with a free end, said tubular wall further having a plurality of captured slots therein, said slots being disposed inboard from said free end, whereby they do not extend through said free end, said end portion of said outer pipe extending telescopically over the end portion of the inner pipe; and
   c. means for clamping the outer pipe to the inner pipe, including means encircling the outer pipe and covering the captured slots for preventing leakage of exhaust gas from the captured slots.

4,113,290
PRESSURE TIGHT JOINT FOR A LARGE DIAMETER CASING

Eishiro Miida, Tokyo, Japan, assignor to Tsukamoto Seiki Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 730,514, Oct. 7, 1976, abandoned. This application Sep. 20, 1977, Ser. No. 835,012
Claims priority, application Japan, Nov. 6, 1975, 50-133478
Int. Cl.[2] F16L *25/00*
U.S. Cl. 285—334 3 Claims

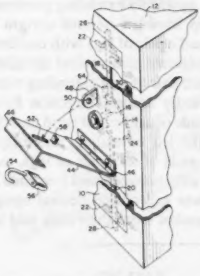


1. A pressure tight pipe joint for a large diameter pipe casing, said pipe joint comprising:
   a first pipe member having internal threads;
   a second pipe member having external threads;
   said internal threads and said external threads each being in the form of buttress-type threads and including alternative crests and roots separated alternately by butt faces and back pressure faces;
   one of said internal threads and said external threads being tapered and having a continuous and straight pitch diameter line inclined at an angle to the longitudinal axis of said pipe members;
   the other of said internal threads and said external threads being divided into at least three tapered sections;
   a first said section having a pitch diameter line coinciding with said continuous pitch diameter line of said one thread, such that said crests, roots, butt faces and back pressure faces of said first section fully contact respective faces of said one thread;
   a second said section having a pitch diameter line diverging from said continuous pitch diameter line of said one thread, such that said butt faces of said second section contact respective butt faces of said one thread, but that said roots and crests and said back pressure faces of said second section are spaced from respective said crests and roots and said back pressure faces of said one thread; and
   a third said section having a pitch diameter line which is parallel to but spaced from said continuous pitch diameter line of said one thread, such that said butt faces of said third section contact respective butt faces of said one thread, but that said roots and crests and said back pressure faces of said third section are spaced from respective said crests and roots and said back pressure faces of said one thread.

4,113,291
SECURITY LOCKING SYSTEM

Gordon Cameron, Greenwood, S.C., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Mar. 14, 1977, Ser. No. 777,050
Int. Cl.[2] E05C *1/06;* E05B *13/02*
U.S. Cl. 292—40 4 Claims



1. In an electric power distribution equipment housing having an access door with a door latching mechanism which includes an operating shaft rotatably mounted to the door, one end of the shaft extending out one side of the door to permit rotation of the operating shaft between a fully latched position and an unlatched position,
   the improvement wherein said door is unlatched when said shaft is rotated less than 72° from its fully latched position, and said one end of said operating shaft is disposed within a recess defined by the surface of said one side of said door, said one end of said shaft comprising a five-sided shaft head which conforms to dimensional requirements of a pentahead bolt specified by the Rural Electrification Administration (R.E.A.) of the U.S. Department of Agriculture for securing an access door of an electric power distribution equipment housing, and said recess of said door conforming to dimensional requirements of a recess cup specified by said Rural Electrification Administration for use with said pentahead bolt; said improvement further comprising:
   a bail, extending from said one side of said door on one side of said recess, which defines an opening therethrough for receiving a shackle of a padlock:

a hasp, pivotably mounted at one end to said side of said door on an opposite side of said recess or rotation between an open position and a closed position, having inner and outer surfaces defining a slot therethrough for receiving said bail as said hasp is rotated into its closed position, said hasp extending over said recess to prevent access to said shaft end therein when said hasp is closed; and

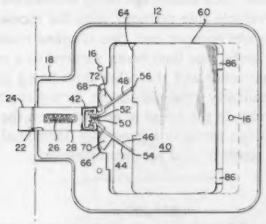
an index tab, disposed on said inner surface of said hasp, which projects into said recess adjacent a respective side of said five-sided shaft head, only when said shaft is in its fully latched position, and said hasp is in its closed position, to thereby lock said shaft in its fully latched position;

whereby said door can be padlocked closed only when said operating shaft is disposed in its fully latched position, an operating tool for said R.E.A. bolt can be used to unlatch said door when said hasp is in its open position, and said hasp can be used as a handle means for opening said door.

4,113,292
LATCH

Richard F. Gauron, Issaquah, and Susana S. Laconte, Auburn, both of Wash., assignors to Marketing Masters, Issaquah, Wash.

Filed Jul. 11, 1977, Ser. No. 814,330
Int. Cl.[2] E05C *1/16*
U.S. Cl. 292—165 **2 Claims**



1. A latching apparatus comprising in combination:

a. a housing provided with mounting means and a hand insertable recess;

b. an associated striker plate;

c. a bolt slideably positioned inside of said housing and partly protruding therefrom for latching engagement with said associated striker plate;

d. a spring means mounted between said bolt and said housing for biasing said bolt in a position causing part of said bolt to protrude out of said housing for latching;

e. a handle cup means slideably positioned inside of said housing in alignment with said recess opening and adapted to receive part of one's hand;

f. a lever means including:

1. a first and a second lever each having a first geared end and a second end, each said first and second lever positioned between said bolt and said handle cup means at a predetermined angle with said second end of each said first and said second lever in slidable contact with said handle cup means;

2. a "U" shaped channel member mounted by its base to said bolt;

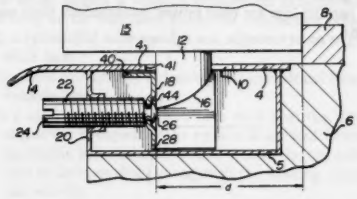
3. a hingeable connection formed between said "U" shaped channel member and said first geared end of each said first and second lever, respectively, whereby said first geared end of said first lever intermeshes with said first geared end of said second lever for synchronized movement of said first and said second lever;

g. shoulder means in said housing for engagement with said first and said second lever, at a location between said first geared end and said second end of each said first and said second lever whereby, upon manual sliding of said handle cup means, each said second end of said first and said second lever slides along said cup means thereby turning said first and said second lever about said hingeable connection in synchronized movement until said first and said second lever engages with said shoulder means so that said first and said second lever pivot about said shoulder means thereby pulling via said hingeable connection said slideably positioned bolt inside of said housing for unlatching said bolt from said associated striker plate, and whereby upon manual release of said handle cup means, said spring means slides said bolt in a latching position and repositions said lever means and said handle cup means.

4,113,293
ADJUSTABLE DOOR LATCH STRIKER

Rolland Paquette, P.O. Box 58, (Hwy. 69 North), Val Caron, Ontario, Canada

Filed Mar. 17, 1977, Ser. No. 778,693
Int. Cl.[2] E05C *21/02*
U.S. Cl. 292—341.18 **8 Claims**



1. An adjustable strike for receiving a latch bolt of a swinging door, said latch bolt having a camming surface and keeper surface, the strike comprising:

a face plate, provided with an opening for receiving the latch bolt of the door when closed, for securing to a door jamb in a doorway over an appropriate cavity and adjacent a door stop;

a lip being an extension of the face plate, to extend from the doorway to engage and depress the latch bolt as the door closes;

a flange secured normal to the plate to extend into or beside the cavity between the plate opening and the lip;

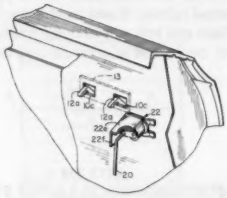
a bolt extending through the flange, the end of the bolt towards the lip to be operatively exposed when the strike is installed and means whereby the bolt may be longitudinally adjusted and secured in the flange being associated with the bolt; and

a movable wall parallel to the flange and spaced therefrom to be within the cavity behind the face plate, positionable within the plate opening so that the keeper surface of the latch bolt will bear against this wall when the door is closed, the other end of the bolt being secured to this movable wall, longitudinal movement of the bolt in the flange causing the wall to move towards or away from the flange to permit alteration of the distance between the doorstop and this movable wall to a distance such that the door when closed will not vibrate against the door stop, forwardly extending sides fixed to the upper and lower ends of the movable wall, these sides slidably guided by guide means to assist in aligning the movable wall, the ends of these sides, after predetermined longitudinal movement of the bolt in one direction, acting as stops by abutting against an appropriately positioned abutment member to stop the bolt from becoming disengaged from the flange by further such longitudinal movement from the flange.

4,113,294
ANTI-THEFT CLIP

Francis Andrew Bierman, 1102 Magnolia Ave., Croydon, Pa. 19020

Filed Jun. 14, 1977, Ser. No. 806,374
Int. Cl.[2] E05C *13/00*
U.S. Cl. 292—346 3 Claims

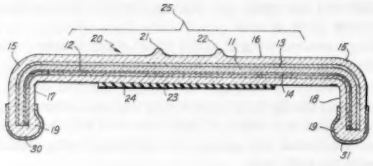


1. A resilient retaining clip for securing a lock cylinder to another member, said clip including a transverse connecting portion having spaced parallel legs extending therefrom a first panel extending from said transverse connecting portion and a second panel extending from said first panel wherein said spaced parallel legs are each bowed intermediate their respective ends.

4,113,295
LONGITUDINALLY CURVED IMPACT RESISTANT TRIM STRIPS

Brian A. Wenrick, Dayton, Ohio, assignor to Protective Treatments, Inc., Dayton, Ohio

Filed Dec. 22, 1976, Ser. No. 753,449
Int. Cl.[2] B60R *19/00*
U.S. Cl. 293—71 R 15 Claims

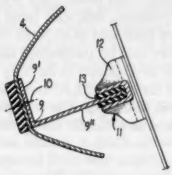


1. A laterally bent, reflective trim strip adapted to be longitudinally curved without subsequent wrinkling of the reflective material comprising, an extrusion comprising a transparent plastic sheath encapsulating a composite metallized strip, said metallized strip having a film of metal sandwiched between and bonded to a layer of high strength and high temperature resistant transparent plastic and a layer of opaque plastic so that the metal film is visible through the front face of said extrusion, said extrusion having a central portion lying in one plane and an edge portion lying in another plane so that when said extrusion is longitudinally curved, either the central portion or the edge portion will be placed in compression, and an elongated compression-resistant element secured to the rear face of said central portion where it is intended to concavely curve said strip and to said edge portion where it is intended to convexly curve said strip to minimize the compressive forces which are imposed upon any portion of the extrusion when the same is longitudinally curved.

4,113,296
BUMPERS ON MOTOR VEHICLES

Norbert Kirsch, Heidesheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 10, 1977, Ser. No. 776,202
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 7609080[U]
Int. Cl.[2] B60R *19/00*
U.S. Cl. 293—96 4 Claims

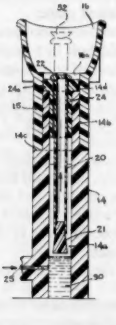


1. A motor vehicle having mounted on one end thereof a bumper terminating at each end in a portion bent to lie adjacent a facing side portion of the vehicle, two anchorages each comprising a plate having two upstanding facing portions defining a recess, and having a layer of a resilient material on each facing portion, each anchorage being secured on a respective one of the vehicle side portions with the recess opening towards the adjacent bumper end, two cranked retainer arms comprising two limbs, one limb being secured to a respective one of the bumper ends and the other limb being grippingly received and resiliently retained in the facing recess of the anchorage whereby, in the event of an impact on the bumper, the bumper ends can move in a generally horizontal plane of the vehicle as a result of said resilient retention.

4,113,297
DEVICE FOR INSERTING AND REMOVING CONTACT LENS

Jack Edward Quinn, 32724 Coastsite Dr., Rancho Palos Verdes, Calif. 90274

Filed Dec. 7, 1977, Ser. No. 858,436
Int. Cl.[2] A61F *9/00*
U.S. Cl. 294—1 CA 5 Claims



1. A device for inserting and removing contact lenses comprising:

a liquid flotation chamber having a longitudinal compartment formed therein,

means for supporting said chamber with said compartment along an axis having a generally vertical orientation, a rod member slidably mounted in said compartment for motion along an axis substantially parallel to the longitudinal axis of said compartment,

means for positioning a human eye in a predetermined position directly above said flotation chamber,

a liquid storage chamber having fluid contained therein, and

means for providing fluid communications between said chambers,

whereby when fluid is transferred from said liquid storage chamber to said flotation chamber to raise the level of liquid within said flotation chamber, said rod member is raised towards the eye to bring the contact lens placed on said rod into contact therewith.

4,113,298

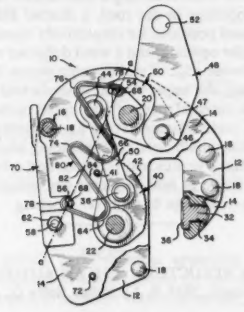
LIFTING CLAMP AND SPRING THEREFOR

Valentine T. Kopp, Lynbrook, N.Y., assignor to Merrill Brothers, Maspeth, N.Y.

Filed Aug. 2, 1976, Ser. No. 710,736

Int. Cl.[2] B66C *1/48*

U.S. Cl. 294—104 **12 Claims**



1. In a clamp of the type used for lifting steel plates including a pair of opposed jaws, said jaws facing each other across a plate-receiving space, one of said jaws being substantially fixed, the other of said jaws being movable across said space toward and away from said fixed jaw to grip a plate positioned therebetween, linkage means for moving said movable jaw into a locked on position in engagement with a plate in said space and out of said locked on position and into a locked open position in which said movable jaw is locked in a position out of contact with any plate in said space, said linkage means being such that when the weight of said plate is on said clamp the weight thereof tends to cause said movable jaw to move into tighter gripping engagement with the plate, and an operating lever for selectively moving said linkage means into and out of said locked on and locked open position, the improvement comprising:

(a) a combination link-spring pivoted at one end to said operating lever and at the other end to said linkage means,

(b) said link-spring when said lever is in said locked open position being under compression,

(c) when said lever is in said locked on position said link-spring being under tension and,

(d) said operating lever during at least the latter portion of its movement from the locked on to the locked open position exerting a compressive force through said link-spring to said linkage means to move the same to the locked open position.

4,113,299

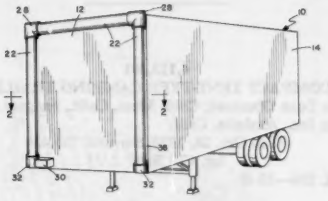
ROTATING MAGNUS TUBES

David W. Johnson, 1884 Sunset Blvd., San Diego, Calif. 92103, and Gary C. Johnson, 724 Renconada La., El Paso, Tex. 79922

Filed Oct. 4, 1976, Ser. No. 729,195

Int. Cl.[2] B62D *35/00*

U.S. Cl. 296—1 S **5 Claims**



1. On a vehicle having a bluff face end wall producing resistance to air having a velocity component orthogonal to said bluff face, an air resistance reduction mechanism comprising:

(a) a cylindrical tube parallel and adjacent to an edge of said bluff face;

(b) means rotationally mounting said cylindrical tube on said vehicle; and

(c) a motor for driving said tube such that the flow of air thereover is expedited to reduce drag, said motor being reversible to cause said tube to spin in the opposite direction to increase drag to augment the braking capability of the vehicle.

4,113,300

FILLER CONNECTION FOR VEHICLES DRIVEN BY INTERNAL COMBUSTION ENGINES

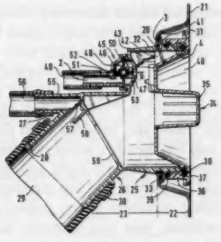
Bernd Schenk, Hamburg, Fed. Rep. of Germany, assignor to ITW-Ateco G.m.b.H., Norderstedt, Fed. Rep. of Germany

Filed Nov. 12, 1976, Ser. No. 741,187

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1975, 2553881

Int. Cl.[2] B60J *9/00*

U.S. Cl. 296—1 C **15 Claims**



1. A one-piece compact plastic fuel filler connection assembly for vehicles driven by internal combustion engines, said connection adapted to be fastened in a non-circular opening (20) in a vehicle body and connected with a conduit (29) leading to a fuel tank of the vehicle, said connection including a first annular portion (25) and an obtuse angularly disposed second annular portion (26) with said first annular portion including an outer section (22) extending through said opening (20) in an outer panel (21) of said body, integral means (32) for quick fastening said outer section (22) to said outer panel (21) in substantially non-rotative sealed relationship, said outer section further including means (4) for accepting a lid (24) in

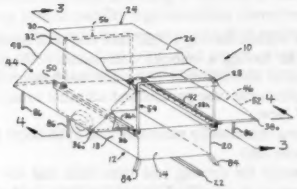
sealed relationship, a pair of membrane one-way check valves (44,45) communicating with an inner section (23) of said first annular portion (25) and said fuel tank and providing overpressure venting and vacuum relief to said tank, said valves (44,45) adapted to be positioned behind said outer panel (21) and non-valved venting means (55) communicating with said connection and said fuel tank for venting during filling.

4,113,301

COMPACT TENT-TYPE CAMPING TRAILER

William Dean Olmstead, Costa Mesa, Calif., assignor to Cycle-Kamp Inc., Anaheim, Calif.

Filed Oct. 26, 1976, Ser. No. 735,429
Int. Cl.[2] B60P 3/34
U.S. Cl. 296—23 H 4 Claims



1. A lightweight and compact tent-type trailer which is easy to set up and collapse and which is especially adapted for towing by motorcycles and the like, comprising:

a trailer bed having upstanding sides and ends and defining a base for a tent when the trailer is in a set-up condition;

first and second hinge means at and along upper marginal edges of opposite ones of said upstanding sides of said trailer bed;

first and second flat floor defining members for said tent connected along one edge thereof to said first and second hinge means respectively to extend in horizontal directions from said bed in said set-up condition;

a top member for covering said trailer bed when the trailer is in a towing condition and for forming a top for said tent when said trailer is in its set-up condition, said top member having marginal edges extending along and outside respective ones of said first and second hinge means connected to said sides of said trailer bed;

tent material secured along said marginal edges of said top member and along an edge of each of said floor defining members opposite the one hinged edge thereof to lay within said trailer and between waid floor defining members and said top member when said trailer is in said towing condition and to form right and left sides, front and back of said tent when said top member is raised and said floor defining members swing outwardly to define said set-up condition, said tent material having a width between said edge of said floor defining members and marginal edge of said top member which is slightly greater than that of said floor member to which it is connected whereby said tent material exerts lifting forces on said floor defining members as said top member is raised to automatically swing said floor defining members upwardly over centers defined by said first and second hinge means as said top member is raised sufficiently high to allow said tent material and floor members to clear said top member and then outwardly from said trailer bed to said set-up condition; and

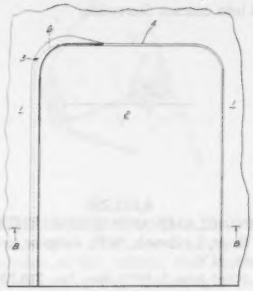
brace members at each corner of said trailer bed for supporting said top member in said set-up condition.

4,113,302

WIND DEFLECTOR

Frans Bos, Trollhattan, Sweden, assignor to Saab-Scania AB, Trollhattan, Sweden

Filed Jan. 19, 1977, Ser. No. 760,746
Claims priority, application Sweden, Jan. 29, 1976, 7600938
Int. Cl.[2] B60J 7/22
U.S. Cl. 296—137 J 7 Claims



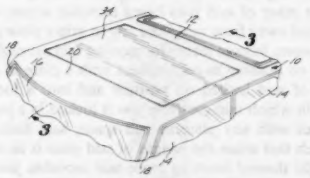
1. In a motor vehicle having a sheet metal roof, a generally rectangular opening in the roof, a shutter movable between open and closed positions for respectively opening and closing said rectangular opening, and a wind deflector extending at the leading transverse edge of said opening across the whole width of said opening, the improvement wherein said wind deflector comprises an integral part of the outer metal sheet of said vehicle roof, said deflector having a rearwardly and upwardly inclined section which overlaps the leading edge of said shutter when the latter is in a closed position, and a reinforcing plate fixed to the inside of said deflector and extending along said leading transverse edge of said roof opening.

4,113,303

ROOF STRUCTURE FOR AN AUTOMOBILE

Charles G. Yench, 3921 E. La Palma Suite Q, Anaheim, Calif. 92806

Filed Apr. 8, 1977, Ser. No. 786,039
Int. Cl. B60J 7/18
U.S. Cl. 296—137 B 5 Claims



1. A roof structure for an automobile comprising in combination,

a sheet metal roof having spaced sheet metal support sections and formed with an opening,

a reinforcing-mounting member formed of plastic material and secured to said support sections to extend along the marginal edge of said opening to reinforce said roof from said support sections to the marginal edge of said opening, said member being formed with a U-shaped channel adjacent the marginal edge of said opening,

a cover for said opening comprising a plastic lid formed with an angularly offset marginal edge insertable into the channel of said reinforcing-mounting member,

sealing means comprising a generally U-shaped flexible

sealing element about said marginal edge of said lid and a generally tubular seal interposed between said element and the side wall of said channel, said sealing means further including a sealing device interposed between said reinforcing-mounting member and the undersurface of said lid adjacent said marginal edge,

a generally U-shaped plastic wind deflector having a main portion and a pair of angularly disposed opposite side portions formed intergrally therewith for insertion within said channel when said cover is removed from said roof, the main and opposite side portions of said deflector each having an extension formed complementally of said channel to fit within and to be retained by the sides of said channel against external forces on said deflector, and

clamp means for securing said cover to said reinforcing-mounting member.

4,113,304

SLIDING AND TILTING ROOF FOR A MOTOR VEHICLE

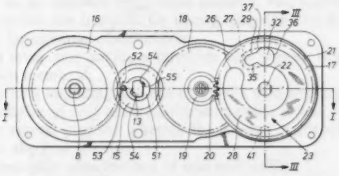
Robert Leiter, Krailling, Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Germany

Continuation of Ser. No. 772,675, Feb. 25, 1977, abandoned. This application Dec. 23, 1977, Ser. No. 863,709

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612484

Int. Cl. B60j *7/02*

U.S. Cl. 296—137 G **9 Claims**



1. Movable vehicle panel member apparatus including a vehicle panel member and driving means for moving said panel member with respect to adjacent vehicle structure, said driving means including:

a rotatable driving member which is drivingly connected to move said panel member in response to rotational movements of said driving member, said driving member having a first stop member,

a shaft,

a crank member drivingly connected to said shaft for applying rotational movement to said shaft,

and a driving plate carried by said shaft, said driving plate having a second stop member engageable with said first stop member to rotate said driving member along with said driving plate, said first and second stop members occupying a small circumferential length of said driving member and driving plate so that said driving plate can be freely rotated from a first position with the second stop member engaging one circumferential side of said first stop member to a second position with the second stop member engaging an oppositely facing circumferential side of said first stop member,

said shaft and said driving plate being connected by lost motion connecting means permitting free relative rotational movement corresponding to the angular range determined by the circumferential lengths of the first and second stop members,

whereby said crank member can be freely returned to a predetermined rotated position for movement to a concealed position, irrespective of the rotative position of the drive member.

4,113,305

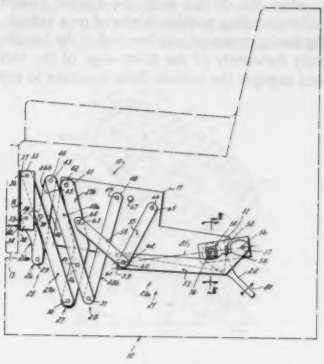
RECLINER LEG REST LINKAGE ASSEMBLY

Edward L. Hampton, Louisville, Ky., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Jun. 6, 1977, Ser. No. 803,955

Int. Cl.² A47C *1/02*

U.S. Cl. 297—69 **9 Claims**



1. A leg rest linkage assembly for a chair's leg rest, said leg rest linkage assembly being adapted to translate said leg rest between a fully extended use position and a fully retracted storage position, said leg rest linkage assembly comprising

a leg rest linkage structured to move said leg rest between said extended and retracted positions, said leg rest linkage being connected between said leg rest and a frame for said chair,

a handle connected to a drive shaft, said handle being accessible for manual operation by the chair's user, rotation of said drive shaft being provided manually through use of said handle, and

a control linkage directly connected in a mechanical linkage series between said drive shaft and said leg rest linkage for controlling movement of said leg rest linkage between extended and retracted positions in response to manual operation of said handle, said control linkage being structured to lock up in a first over-center position when said drive shaft is rotated in one of a clockwise and counterclockwise direction for locking said leg rest in said retracted position, and said control linkage being structured to lock up in a second over-center position when said drive shaft is rotated in the other of said clockwise and counterclockwise directions for locking said leg rest in said extended position, said locked up control linkage preventing drift of said leg rest out of said retracted position toward said extended position in response to a force exerted on said leg rest in the extension direction, and preventing drift of said leg rest out of said extended position toward said retracted position in response to a force exerted on said leg rest in the retraction direction, when no user is seated in said chair.

4,113,306

CONVERTIBLE CHILD RESTRAINT

Heinrich F. von Wimmersperg, 15721 Rosemont Rd., Detroit, Mich. 48223

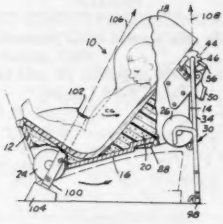
Continuation-in-part of Ser. No. 635,653, Nov. 26, 1975, Pat. No. 4,067,608. This application Apr. 11, 1977, Ser. No. 786,078

Int. Cl.² B60R *21/10*

U.S. Cl. 297—216 **7 Claims**

1. A device convertible from a child's stroller to a safety restraint seat for use in a vehicle comprising, a shell in which the child is adapted to be placed in a generally inclined upright position; ground-engaging wheels mounted on the shell adja-

cent the front and rear ends thereof; a handle mounted adjacent the rear end of the shell and adjustable to a first position where it extends upwardly and rearwardly from the shell to enable use of the device as a child's stroller and to a second position where it extends downwardly from the shell to a level substantially below the plane of said wheels and means for locking the handle in either of said two positions relative to the shell whereby, when the device with the handle locked in said downwardly extending position is placed on a vehicle seat in a rearwardly facing direction, the free end of the handle projects downwardly forwardly of the front edge of the vehicle seat cushion and engages the vehicle floor structure to support the



shell such that the child therein is positioned in a rearwardly facing upwardly inclined position, means on said shell for interengaging the shell with a conventional vehicle seat belt associated with the vehicle seat so that the belt, when tightened around the shell, inclines upwardly in a forwardly direction, and rigid journal members on each side of said shell, said handle being pivotably mounted on said journal members for swinging movement between said first and second positions, said handle comprising a pair of generally parallel legs interconnected by a cross bar, said legs each comprising a pair of pivotably connected sections, said sections being swingable from an extended position to an overlapping nested position for shortening the effective length of the handle.

4,113,307

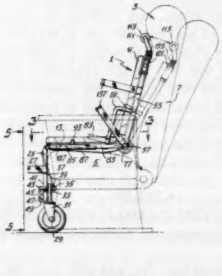
TRAVEL INSERT CHAIR AND METHOD OF TRANSPORTING THE PHYSICALLY HANDICAPPED

Frederick L. Day, Rte. 2, Box 78, Ladson, S.C. 29456

Continuation-in-part of Ser. No. 680,766, Apr. 27, 1976. This application May 25, 1977, Ser. No. 800,434

Int. Cl.[2] A47C *15/00*

U.S. Cl. 297—232 **19 Claims**



7. An insert travel chair comprising:

(a) a seat having a front and rear,

(b) a back attached to the rear of said seat,

(c) a pair of wheels,

(d) means for pivotally and rotatably attaching said wheels to the front of said seat,

(e) the area under the rear of said seat being substantially unobstructed whereby said seat may be positioned over a conventional seat,

(f) leg means extending downwardly from the rear of said seat, said leg means being movable from a ground engaging position to a non-ground engaging position,

(g) a pair of back handles extending from said back for pivoting the chair to permit movement from place to place,

(h) said pair of back handles being adjustably positioned on said back, means for pivoting said back handles from a substantially vertical position to a substantially horizontal position,

(i) a pair of front handles pivotally connected to the front of the chair adjacent said wheels and movable in a substantially horizontal plane from a position parallel to the front of the chair to a position substantially perpendicular to the front of the chair.

4,113,308

TILTABLE SEAT

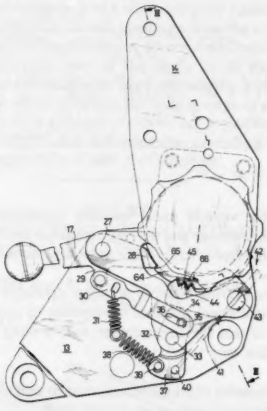
Paul Werner; Egon Wirtz, and Gerhard Lehmann, all of Remscheid, Fed. Rep. of Germany, assignors to Keiper K. G., Remscheid-Hasten, Fed. Rep. of Germany

Continuation of Ser. No. 616,410, Sep. 24, 1975, abandoned. This application Apr. 12, 1977, Ser. No. 786,815

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1974, 2446181

Int. Cl.[2] A47C *1/025;* **B60N** *1/06*

U.S. Cl. 297—362 **8 Claims**

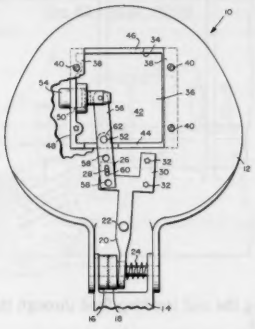


1. In a seat, particularly in a vehicle seat, a combination comprising a seat element; a back element; means for mounting said back element on said seat element for tilting from a selected erect position in a frontward and a rearward range; two blocking arrangements interposed between said elements and each including engaging means normally so blocking said back element in said selected erect position as to prevent the same from tilting in both of said ranges, and abutment means normally so blocking said back element in said selected erect position as to prevent the same only from tilting in said rearward range; and means for releasing said back element for selective tilting, including shared first disengaging means for disengaging only said engaging means of both of said blocking arrangements to thereby release said back element for tilting only in said frontward range, and two mutually separate second disengaging means each for jointly disengaging both said engaging and said abutment means of only one of said blocking arrangements so as to require the actuation of both of said separate second disengaging means when it is desired to release said back element for tilting in said rearward range.

4,113,309
HEADREST FOR DENTAL CHAIR

Charles E. Brockway, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,351
Int. Cl.[2] A47C 1/10
U.S. Cl. 297—408 8 Claims



1. In a headrest for dental chairs and the like including a headrest frame journaled for articulation to the dental chair, clutch members within the headrest frame for locking the headrest in an adjusted articulated position, and a lever arm pivoted within the headrest for disengaging the clutch members, the improvement comprising:

a. said lever arm having a bifurcate end remote from said clutch members;

b. a housing including side and end walls, said housing being attachable to said headrest frame in either a first position or a second position wherein the housing is rotated 180° from the first position;

c. a pivot post adjacent one of said end walls;

d. a push button extending through one of said side walls;

e. a link having one end connected to said push button and a second end;

f. said link, when said housing is in said first position being fixed to a first branch of said bifurcate lever end to form an extension of said one branch, said link and lever together forming a simple level system for disengaging said clutch members when said push button is operated; and

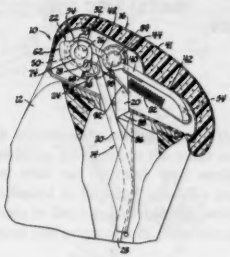
g. said link, when said housing is in said second position, being pivoted intermediate its ends to said pivot post, said second link end being pivotally connected to the second branch of said bifurcate lever end, said link and lever so connected together forming a compound lever system for disengaging said clutch members when said push button is operated.

4,113,310
HEADREST FOR VEHICLES

Harley L. Kapanka, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 21, 1977, Ser. No. 862,954
Int. Cl.[2] A47C 1/10
U.S. Cl. 297—408 2 Claims

1. For use with the backrest of a vehicle seat, an angularly adjustable head restraint assembly comprising a post carried by and mounted interiorly of the backrest and projecting exteriorly therefrom at the upper end thereof, headrest means pivotally connected to said post and adapted to being manually pivotally moved from a horizontally oriented reclined attitude to a vertically oriented head support attitude, slot means formed in said post, cam means pivotally connected to said post and adapted to being pivotally moved into and out of said slot means, a locking lever pivotally connected to said headrest means adjacent said cam means, projection means formed on an upper portion of said locking lever, overcenter spring means operatively connected to said cam means, and resilient means operatively connected to said locking lever, said resilient means being adapted to initially urge said locking lever into contact with said post and then into said slot means into contact with said cam means when said headrest means is pivoted upwardly through a predetermined angle relative to said post means, thereby locking said headrest means against reverse rotation to said horizontally oriented reclined attitude until said headrest means is pivoted forwardly a predetermined

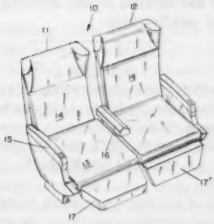


amount into a greater angular relationship with said post to contact and pivot said cam means so as to cause said cam means to snap overcenter in a rearward direction into said slot means under the force of said overcenter spring means and move said locking lever out of said slot means to permit said headrest means to be lowered toward said horizontally oriented reclined attitude until said projection means on said locking lever contacts said cam means and causes said cam means to snap overcenter in the other direction under the force of said overcenter spring means into position for the next sequence.

4,113,311
SINGLE PIVOT CONNECTION FOR A LEGREST

William D. Reids, Divide, Colo., assignor to AMI Industries, Inc., Colorado Springs, Colo.

Filed Jul. 25, 1977, Ser. No. 818,805
Int. Cl.[2] A47C 7/50
U.S. Cl. 297—433 5 Claims



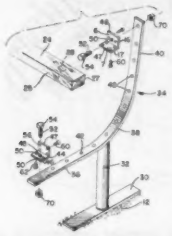
1. A single pivot connection for a legrest of a vehicle seat and the like comprising a mounting bracket secured to the inner sheel of an armrest of a seat and having a shaft extending therefrom, an arm bracket attached to a legrest and having a cylindrical portion with an end surface, there being a hub on the end surface of said cylindrical portion and having a circumferentially extending notch therein, said end surface being pivotally mounted on said shaft, a gear having peripheral gear teeth non-rotatably mounted on said shaft, a pawl member engageable with said gear teeth, means mounted on said hub and having limited pivotal movement thereon for disengaging said pawl member from said gear teeth when said legrest is pivoted through a predetermined angle with respect to said

seat, a braking disc between the cylindrical portion of said hub and said gear, and means for resiliently urging said hub, gear and braking disc together at a predetermined force so that said legrest is pivotable downwardly upon application of a predetermined force thereto.

4,113,312
BENCH

Gerald P. Skalka, Potomac, Md., assignor to Victor Stanley, Inc., Dunkirk, Md.

Filed Jan. 31, 1978, Ser. No. 873,976
Int. Cl.[2] A47C 7/02
U.S. Cl. 297—454 **10 Claims**



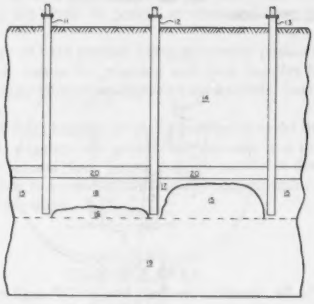
1. A bench including first and second spaced and aligned frame means each including a frame plate element of desired configuration, a plurality of angle brackets formed solely of first and second mutually perpendicular plates each having an inner face and an outer face, a plurality of wooden slat members each having a top face, a bottom face and two side faces, bracket attachment means attaching said first plates of said angle brackets to a respective one of said first and second spaced and aligned frame members with each of the outer faces of the first plates engaging the frame member to which it is attached and the brackets on the first frame means being aligned with the brackets on the second frame means with each bracket member having its second plate extending outwardly perpendicularly from the frame means to which it is attached, each of said slat members having its bottom face resting on the inner faces of the first plates of two of said aligned brackets and having a side face abutting against the inner faces of the second plates of the two aligned brackets on which the respective slat is mounted and slat fastener means fastening said slats to said second plates of said brackets.

4,113,313
RECOVERING URANIUM FROM COAL IN SITU

Ruel Carlton Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Filed May 16, 1977, Ser. No. 797,536
Int. Cl.[2] E21B 43/28
U.S. Cl. 299—4 **11 Claims**

1. A method of recovering mineral values adsorbed in an underground coal deposit, comprising the steps of
establishing a first passage between a surface location and the underground deposit of coal,
establishing a second passage between a surface location and the underground deposit of coal, the said second passage being spaced apart from the said first passage,
establishing a third passage between the said first passage and the said second passage, the said third passage being located in the said coal.
igniting the said coal,
injecting an oxidizer into the said coal,
burning a portion of the said coal to residual ash,
terminating injection of said oxidizer,
injecting a cooling fluid into the burned out area,
continuing injection of the said cooling fluid until the temperature of the said residual ash is below the boiling point temperature of a leaching liquid,
terminating injection of the said cooling fluid,
injecting the said leaching fluid through the said first passage,

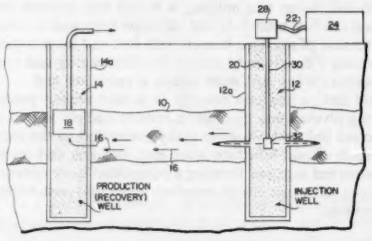


percolating the said leaching fluid through the said residual ash, and
capturing the said leaching fluid together with the mineral content taken into solution in the said leaching fluid and delivering the pregnant solution to the surface of the ground.

4,113,314
WELL PERFORATING METHOD FOR SOLUTION WELL MINING

George A. Savanick, Apple Valley, and Walter G. Krawza, Lakeville, both of Minn., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 24, 1977, Ser. No. 809,881
Int. Cl.[2] E21B 43/114; E21C 41/14
U.S. Cl. 299—4 **5 Claims**



1. In a solution mining method wherein an injection well and at least one recovery well are employed which extend at least to the depth of a mineralized zone and a leaching solution is pumped from the injection well through the mineralized zone to the recovery well and pumped up from the latter in a liquid solution containing the mineral to be recovered and wherein the walls of said wells include a cemented plastic casing, the improvement in said method comprising the step of perforating the cemented plastic casing of the walls of said injection well and said at least one recovery well using a high pressure water jet so as to provide a plurality of holes therein, the pressure of said high pressure jets being several thousand psi, said holes in the recovery well being on a non-uniform, predetermined pattern along the height of the well adjacent to the mineralized zone with their greatest density being near the bottom of the mineralized zone and the least density of holes being adjacent to the top of the mineralized zone.

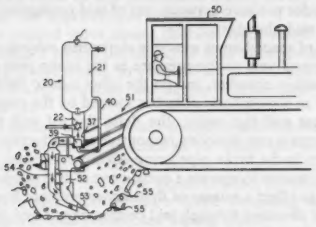
4,113,315
COMBUSTION APPARATUS FOR GENERATING REPETITIVE EXPLOSIONS

Rosser B. Melton, Jr., Helotes; John W. Colburn, Jr., and Charles D. Wood, III, both of San Antonio, all of Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Division of Ser. No. 427,040, Dec. 21, 1973, Pat. No. 3,880,568. This application Oct. 16, 1974, Ser. No. 515,310

Int. Cl.[2] E21C *29/00*

U.S. Cl. 299—13 **5 Claims**



1. Apparatus employing repetitive explosions for earth fracture, comprising, in combination:

a tractor;

ripper means mounted on said tractor and adapted to penetrate the earth;

staged combustion apparatus for generating repetitive explosions in the earth adjacent said ripper means, said staged combustion apparatus comprising a first chamber including an inlet in said chamber adapted to be connected to a source of combustible fluid, ignition means mounted in said first chamber for igniting fluid therein, a second chamber adjacent said first chamber and including an outlet for repetitive discharge of ignited fluid under pressure, means providing for fluid communication from said first chamber to said second chamber, and valve means disposed in said second chamber for preventing the passage of fluid under pressure from said second chamber into said outlet except when the pressure in said second chamber exceeds the pressure in said first chamber by a predetermined amount; and

duct means connected to said outlet for conducting gas under pressure externally of said ripper means from said outlet for discharge into the earth adjacent an end of said ripper means.

4,113,316
FUNNELING MACHINE WITH INCLINED ADVANCING RAMS

Reginald Andrew Phillips, Skelmersdale; Terence Hamilton, Wigan, and Arthur David Thompson, Chorley, all of England, assignors to Dobson Park Industries Limited, Nottingham, England

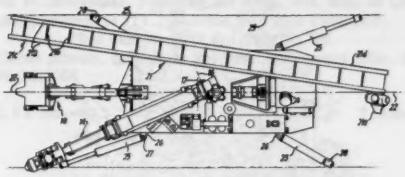
Filed Oct. 15, 1976, Ser. No. 734,637

Claims priority, application United Kingdom, Oct. 15, 1975, 42122/75

Int. Cl.[2] E21D *9/10*

U.S. Cl. 299—31 **6 Claims**

1. A vehicle for use in a mine working for enlarging a tunnel or forming a heading, comprising a chassis or like structure, a percussive action rock breaker and an independently operable bucket loader movably mounted on such chassis, a conveyor means supported by the chassis, the conveyor means extending generally longitudinally of the chassis from a position at the forward end thereof whereat the said conveyor means can receive rock and spoil collected by the bucket loader to a position at the rearward end of the chassis whereat the conveyor means can discharge rock and spoil for disposal, and a plurality of rams pivotally mounted on and extending laterally outwardly of the chassis, each for engagement with a respective opposed surface of the mine working, the plurality of rams including individual rams located at the sides of the chassis at the forward and rearward ends thereof, the rams at the forward end of the chassis inclined upwardly and adapted to be extended transversely outwardly of the chassis, the rams at the rearward end of the chassis inclined downwardly and adapted



to be extended transversely outwardly of the chassis, and respective claws being provided at the outer ends of the rams for engagement with an opposed wall surface, said rams thereby being adapted to impart a selective translational motion to said chassis in the forward and rearward directions on alternate extension and retraction of the rearmost or foremost rams.

4,113,317
BRAKE PRESSURE REDUCING CONTROL VALVE

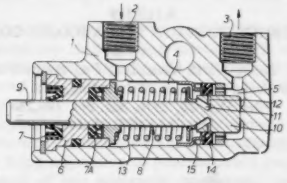
Glyn Phillip Reginald Farr, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Mar. 30, 1977, Ser. No. 782,938

Claims priority, application United Kingdom, Mar. 30, 1976, 12768/76; Aug. 12, 1976, 33688/76

Int. Cl.[2] B60T *8/26*

U.S. Cl. 303—6 C **12 Claims**



1. A pressure reducing valve for a vehicle braking system, comprising a housing having an inlet and an outlet, differential area means in said housing subject to inlet and outlet pressures and arranged to provide a pressure at said outlet reduced from the pressure at said inlet, means defining a radial port having an inlet end in permanent communication with said inlet and an outlet end communicating with said outlet, and an elastomeric seal movable relative to said port between a closed position in which said seal covers said port and an open position, wherein in said closed position said seal is arranged to cover the port at the outlet end thereof and the interface between said seal and said port is at all times subjected to inlet pressure.

4,113,318
LOAD-RESPONSIVE PRESSURE PROPORTIONING REDUCING VALVE ASSEMBLY FOR VEHICLE HYDRAULIC BRAKE SYSTEM

Kaname Doi, Ibaraki, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 8, 1977, Ser. No. 804,572

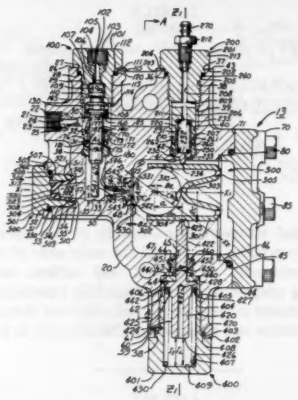
Claims priority, application Japan, Jun. 11, 1976, 51-68878

Int. Cl.[2] B60T *8/14*

U.S. Cl. 303—24 F **18 Claims**

17. A load-responsive pressure reducing valve assembly

comprising fluid pressure proportioning means for restricting the flow of fluid from a fluid inlet to a fluid outlet during a predetermined range of increasing fluid pressure at said outlet and deceleration sensing means including an inertia-responsive member responsive to a predetermined rate of deceleration of the assembly to move a predetermined distance from a stop to



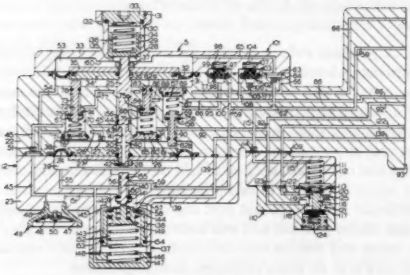
thereby set the starting pressure of said predetermined range of increasing fluid pressure, and a piston having only one effective pressure receiving area slidably received through a fluid seal and subjected to fluid under a predetermined pressure from said inlet to displace said piston against a bias and thereby act on said inertia-responsive member to increase the deceleration of the assembly to be sensed.

4,113,319

EMERGENCY PORTION FOR A BRAKE CONTROL VALVE

Michael T. Zoric, North Versailles, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Dec. 10, 1976, Ser. No. 749,288
Int. Cl.[2] B60T *15/44*
U.S. Cl. 303—37 **14 Claims**



1. For use in a brake apparatus including a brake pipe, an auxiliary reservoir and an emergency reservoir each normally charged to a certain chosen pressure, a brake cylinder and a fluid-pressure-operated service valve device, a fluid-pressure-operated emergency valve device operative in conjunction with said service valve device in response to a reduction of the pressure in the brake pipe at an emergency rate to effect the supply of fluid under pressure from said reservoirs to said brake cylinder to cause an emergency brake application, said emergency valve device comprising:

(a) a casing having therein a plurality of chambers, bores and passageways, each bore connecting at least two of said chambers and certain of said bores having formed at one end an annular valve seat and four of said passageways respectively opening at one end into four of said bores and having the other end connected respectively to the emergency reservoir, the brake cylinder, the brake pipe and another chamber other than one of said plurality of chambers,

(b) a plurality of poppet-type valves each having a fluted stem slidably mounted in one of said bores whereby the respective valve cooperates with the annular valves seat at the one end of the corresponding bore to control flow of fluid under pressure between one of said passageways and one of said chambers,

(c) a pair of spaced-apart movable abutments subject on one side respectively to the pressure in the brake pipe and in said another chamber, and on the other side to fluid pressure in an atmospheric chamber formed by the respective abutment and the casing, the deflection of said pair of abutments in one direction responsive to a reduction of the pressure in the brake pipe being effective to cause one of said abutments to operate a certain one of said poppet-type valves to effect a release of fluid under pressure from said another chamber through said certain one of said poppet-type valves directly, only to said atmospheric chamber and another of said poppet-type valves to effect the supply of fluid under pressure from the emergency reservoir to the brake cylinder, and the deflection of said pair of abutments in an opposite direction responsive to a subsequent increase of the pressure in the brake pipe being effective to cause the other of said abutments to operate still another of said poppet-type valves to effect the supply of fluid under pressure from the brake cylinder to the brake pipe,

(d) a first vent passageway between another one of said bores and atmosphere,

(e) a hollow stem interconnecting said pair of abutments and forming a central passageway via which fluid pressure in said atmospheric chamber is communicated with said first vent passageway, said stem being slidably mounted in said another one of said bores and including valve means for controlling said communication in accordance with deflection of said abutments, and

(f) a first choke in said first vent passageway via which the fluid pressure in said another chamber is vented to atmosphere at a certain chosen rate by said valve means when said certain one of said poppet-type valves is operated.

4,113,320

BRAKE VALVE DEVICE

Richard F. Balukin, Penn Hills, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sep. 21, 1977, Ser. No. 835,123
Int. Cl.[2] B60T *15/06*
U.S. Cl. 303—54 **10 Claims**

1. In a brake valve device, of the type having a fluid-pressure-operated relay valve device for controlling the application and release of brakes in accordance with variations in the pressure of fluid supplied to said relay valve device, the combination with said relay valve device of a control valve device for controlling the supply of fluid under pressure to and the release of fluid under pressure from said relay valve device, said control valve device comprising:

(a) release valve means for controlling the release of fluid under pressure from said fluid-pressure-operated relay valve device to atmosphere,

(b) a first valve means arranged in abutting relation to said release valve means for controlling the supply of fluid under pressure to said fluid-pressure-operated relay valve device,

(c) a first biasing means for providing a preselected biasing force corresponding to a desired maximum fluid pressure supplied to said relay valve device,

(d) a movable abutment subject opposingly to the pressure of fluid supplied to said relay valve device and to said prese-

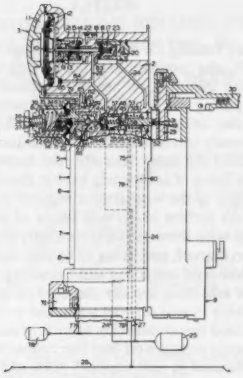
lected biasing force of said first biasing means, said abutment being so arranged with respect to said release valve means and said first valve means as to enable said first biasing means to effect closing of said release valve means and opening of said first valve means so long as as said preselected biasing force exceeds the fluid pressure force of the fluid supplied to the relay valve device thereby enabling said control valve device to operate as a self-lapping valve device to supply fluid under pressure to said relay valve device until said fluid pressure force is substantially equal to said preselected biasing force,

wherein the improvement comprises:

(e) a second valve means shiftable from a first position, in which it effects the supply of fluid under pressure to said first valve means, to a second and a third position in each of which positions said supply of fluid under pressure is cut off,

(f) a second biasing means so interposed between said first and second valve means as to, while said second valve means is in its said first and second positions, transmit a force to said first valve means to effect the closing thereof upon said fluid pressure force becoming substantially equal to said preselected biasing force,

(g) means carried by said second valve means for rendering said second biasing means ineffective to close said first valve means only upon shifting of said second valve means to its said third position,



(h) a third biasing means for effecting shifting of said second valve means from its said first position to its said second and third positions,

(i) operator-controlled means selectively operable to a first position to effect shifting of said second valve means against the yielding resistance of said third biasing means to its said first position in which fluid under pressure is supplied via said first and second valve means in series to said relay valve device until said fluid pressure force is substantially equal to said preselected biasing force, to a second position in which said third biasing means is rendered effective to shift said second valve means from its first position to its second position in which the supply of fluid under pressure to said second valve means is cut off, and to a third position in which said supply of fluid under pressure to said second valve means remains cut off, and said means carried by said second valve means renders said second biasing means ineffective to close said first valve means, and

(j) a fourth biasing means carried by said movable abutment and operable to effect operation of said release valve means to release fluid under pressure from said fluid-pressure-operated relay valve device to atmosphere only upon shifting of said second valve means to its said third position, in which said means carried by second valve means renders said second biasing means ineffective to transmit a force to said first valve means to effect closing thereof.

4,113,321

ANTI-SKID ELECTRONIC CONTROL SYSTEM HAVING AN ERROR DETECTING CIRCUIT

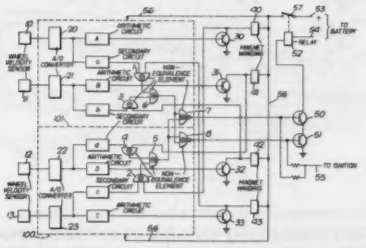
Hans W. Bleckmann, Frankfurt am Main, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,798

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612356

Int. Cl.² B60T *8/00*

U.S. Cl. 303—92 **7 Claims**



1. An improvement in a digital anti-skid electronic control system including a different channel assigned to each controlled wheel, each of said channels having a converter to convert a sensed wheel velocity signal into a digital value and a digital arithmetic circuit connected to said converter to provide an output signal to control a final control element which controls braking pressure, said improvement comprising:

a digital secondary circuit for each of said channels, each of said secondary circuits being identical with one of said arithmetic circuits, each of said secondary circuits being connected to the output of a different one of said converters; and

a digital circuit means coupled to said arithmetic circuit and said secondary circuit of each of said channels, said circuit means being responsive to predetermined output signals from each of said arithmetic circuits and each of said secondary circuits to detect an error condition in any of said arithmetic circuits and any of said secondary circuits and to disable said control system entirely upon detection of said error condition.

4,113,322

DIGITAL CONTROL CIRCUIT FOR PRODUCING ACCELERATION AND DECELERATION CONTROL SIGNALS IN AN ANTISKID CONTROL SYSTEM

Gerhard Ruhnau; Wolfgang Gudat, both of Hanover; Peter Liermann, and Karl-Heinz Hesse, both of Gehrden, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 24, 1977, Ser. No. 809,886

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1976, 2631227

Int. Cl.² B60T *8/08*

U.S. Cl. 303—105 **19 Claims**

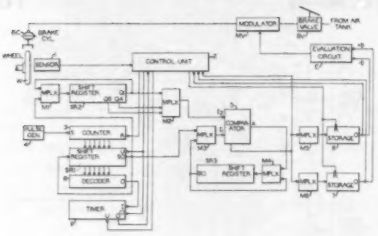
1. A vehicle antiskid control system including a brake cylinder, an operator's brake valve device, a conduit connecting said brake cylinder and said brake valve device via which fluid brake pressure is supplied to said brake cylinder from a source and released from said brake cylinder, a modulator valve unit in said conduit between said brake cylinder and said brake valve device for influencing the fluid brake pressure independently of said brake valve device, a wheel sensor for generat-

ing a pulse signal having a frequency proportional to the speed of the wheel with which said sensor is associated, circuit means operative responsive to said pulse signal for producing acceleration and deceleration response control signals; and an evaluation circuit subject to said control signals for effecting operation of said modulator valve unit, said circuit means comprising the improvement of:

(a) means for measuring the duration of a cycle of said pulse signal comprising:

(i) means for generating a clock signal of higher frequency than said pulse signal; and

(ii) a digital counter subject at its input to said clock signal,



said counter being periodically reset in synchronism with said pulse signal whereby said clock pulses are counted for the duration of a cycle of said pulse signal to provide a count signal representing the measured cycle duration;

(b) means for establishing a reference cycle duration from said measured cycle duration of a previous pulse signal; and

(c) means for providing said control signals when the difference between said reference cycle duration and said measured cycle duration of an immediate pulse signal exceeds said reference cycle duration by a predetermined admissible amount.

4,113,323

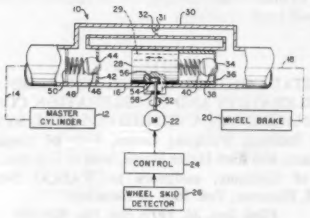
ANTI-SKID POWER VALVE

James Richard Haney, Uniontown, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Jun. 15, 1977, Ser. No. 806,796

Int. Cl.[2] B60T *8/10*

U.S. Cl. 303—115 **12 Claims**



1. Brake control apparatus including a hydraulic pressure supply line, a wheel brake system, and an anti-skid power valve means operatively connecting the pressure supply line to the wheel brake system and comprising

a driven means including a check valve to force liquid from the wheel brake system to the pressure supply line when skid conditions exist, and

bypass means connecting said pressure supply line to the wheel brake system and including a flow control orifice to permit continual flow of pressure liquid to the wheel brake system, the flow rate of the liquid from the wheel brake system when said driven means are actuated being greater than the return pressure liquid flow through the orifice.

4,113,324

AUXILIARY BEARING FOR DETERMINING RADIAL AND AXIAL PLAY OF TURBINE SHAFTS

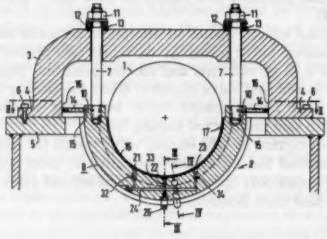
Karl Rohr, Mülheim, Ruhr, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Ruhr, Germany

Filed Nov. 16, 1976, Ser. No. 742,195

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1975, 2551801

Int. Cl.[2] F16C *23/00*

U.S. Cl. 308—9 **3 Claims**



1. Auxiliary bearing for determining radial an axial play of a turbine shaft, the auxiliary bearing having a bridge-shaped carrying yoke mounted on bearing brackets, swingable and turnable adjusting bolts suspending a semicircular support yoke from the bridge-shaped carrying yoke, and adjusting bolts horizontally screwable into the semicircular support yoke so as to deflect the latter laterally, the improvement therein comprising a lining of antifriction babbitt metal disposed on the inner periphery of the semicircular support yoke for slideably supporting the turbine shaft, said lining of antifriction metal being formed with three oil pockets serially disposed in peripheral direction thereof, said lining of babbitt metal being formed with a respective oil collecting slot extending, respectively, on both sides of said three serially disposed oil pockets along the entire periphery of said support yoke, and including a separate pressure oil feed line connection to each of said three oil pockets, said separate pressure oil feed line connections comprise oil feed bores formed in said support yoke and communicating respectively with said oil pockets, and a choke respectively disposed in each of said oil feed bores, and having a flow-through cross secton adjusted to a given oil pressure for the respective oil feed bore.

4,113,325

SUPPORTING DEVICE

Helmut Miller, Niederrohrdorf, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 23, 1976, Ser. No. 744,319

Claims priority, application Switzerland, Dec. 2, 1975, 15606/75

Int. Cl.[2] F16C *32/06*

U.S. Cl. 308—9 **8 Claims**

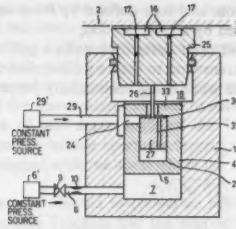
1. Apparatus for supporting a mobile part which moves relatively to a load-bearing part and which is subjected to dynamic forces, the apparatus comprising

a. a hydrostatic support device including a supporting piston containing at least one pressure pocket which opens toward the mobile part, a hydraulic supporting motor having a pressure chamber and which urges the supporting piston toward the mobile part, and a throttled passage connecting the pressure chamber with the pocket;

b. first and second sources of hydraulic fluid at constant pressure connected with the pressure chamber by first and

second supply passages, respectively, the second source having a higher pressure level than the first; and

c. hydraulic control means which responds to the rate of displacement of the supporting piston and which allows only the first source to pressurize the pressure chamber under static conditions and during slow displacements,



and allows only the second source to pressurize the pressure chamber when the piston is displaced rapidly in the direction which reduces pressure chamber volume,

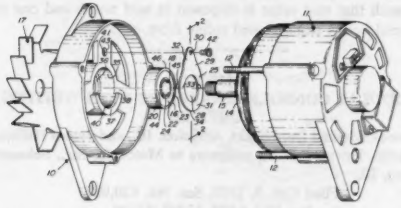
d. whereby the supporting piston furnishes a constant, relatively small reaction under normal conditions, and a larger reaction when said rapid displacement occurs.

4,113,326

ALTERNATOR BEARING RETAINER PLATE

Franklin Crawford Brewster, Franklin Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 19, 1976, Ser. No. 706,670
Int. Cl.[2] F16C *35/00*
U.S. Cl. 308—26 **17 Claims**



13. A method of retaining an automotive alternator bearing in a housing which comprises the steps of:

forming a recessed opening for the bearing in the housing;

forming a lip containing a groove in the housing;

forming a resilient retainer plate with a first and second portion, the first portion being adapted to be retained in the lip containing the groove;

inserting the first portion of the plate into the groove; and

drawing the second portion of the locking plate to the housing to bias the bearing into the recessed opening in said housing.

4,113,327

COMBINATION SEAL AND THRUST WASHER FOR ANTI-FRICTION BEARINGS

Hans W. Koch, Levittown, Pa., assignor to Roller Bearing Company of America, West Trenton, N.J.

Filed Dec. 29, 1976, Ser. No. 755,445
Int. Cl.[2] F16C *33/78*
U.S. Cl. 308—187.1 **7 Claims**

1. In combination,

an outer roller member having end flanges providing grooves spaced inwards from its ends with inner and outer radial faces and having therebetween an inside cylindrical surface providing an outer race,

a plurality of roller bearing rollers in supporting engagement with said outer race and terminating inwardly of the outer radial faces of the grooves,

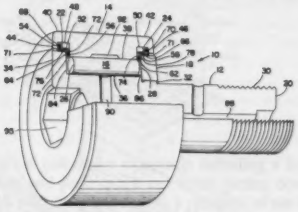
an inner member having an outside cylindrical surface spaced inwardly from said inside cylindrical surface and providing an inner race for engagement by said roller bearing rollers,

retainer members at each end of said inner member for holding said roller member, said roller bearing rollers and said inner member in position,

at least one of said retainer members being removably carried on said inner member,

said retainer members having outer cylindrical faces contiguous to said flanges and inner radial faces,

annular seals each having



an intermediate cylindrical portion in engagement with said outer cylindrical portion of one of said retainer members,

a radially outwardly extending flange portion extending from one end of said intermediate portion and in engagement with an outer radial face of one of said grooves, and

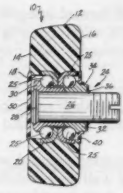
a radially inwardly extending flange portion extending from the other end of said intermediate portion and in engagement with an inner radially face of said one of said grooves.

4,113,328

WHEEL BEARING ASSEMBLY WITH PLASTIC BEARING SEALS

Douglas J. Vander Meulen, Shelbyville, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Aug. 22, 1977, Ser. No. 826,758
Int. Cl.[2] F16C *33/72*
U.S. Cl. 308—187.1 **24 Claims**



1. A wheel bearing assembly comprising a wheel formed from a thermoplastic material and having an outer circumference, opposing sides and an axially extending, central aperture therethrough; an outer raceway in said axially extending central aperture for receiving at least one row of antifriction bearings; an inner race having an inner raceway radially spaced from and axially aligned with said outer raceway for receiving at least one row of antifriction bearings; a plurality of antifriction bearings disposed in at least one row in said raceways; said inner race having an annular surface axially outward of said inner raceway on at least one side of said inner raceway; and an annular seal formed from a resilient, thermoplastic material and having an outer edge with a maximum radial dimension smaller than the circumference of said wheel and an annular inner edge defining an aperture through said seal; said seal being assembled over said inner race such that said seal centers itself, an inner portion of said seal sealingly engaging said annular surface of said inner race, said seal aperture being coaxial and concentric with said inner race, an outer

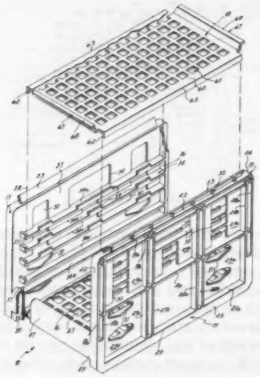
portion of said seal spaced from said annular inner edge being fused to said thermoplastic wheel after such assembly whereby moisture, dirt and other contaminants are prevented from entering said bearing area including said raceways and bearings.

4,113,329

MULTI-TRAY BASKET

Paul G. Thurman, West Liberty, Ohio, assignor to Dare Pafco, Inc., Urbana, Ohio

Filed May 12, 1977, Ser. No. 796,478
Int. Cl.[2] B65D *21/04;* A47F *3/14*
U.S. Cl. 312—111 **7 Claims**



1. A multi-tray basket comprising

a molded basket frame having a floor and two opposing side walls, said frame being fabricated of a one-piece configuration,

at least one unitary molded tray adapted to be located between said opposing side walls at a vertical position elevated above said floor, said tray including a downwardly depending rib on each of the two opposing side edges thereof,

at least one shelf rail formed integral with each of said basket's two side walls, said tray's ribs being adapted to sit on said shelf rails for locating said tray at said elevated vertical position,

a front stop on at least one of said shelf rails, and a rear stop on at least one of said shelf rails, to prevent forward/rearward motion of said tray on said rails once said tray is seated thereon,

stacking structure molded integral with the top and bottom edges of each side wall for permitting an upper multi-tray basket to be stacked on top a lower multi-tray basket, said stacking structure including a stacking rib on the top edge of each side wall, and a stacking rail along the bottom edge of each side wall, said stacking ribs and rails being adapted to interfit one with the other to prevent forward-/rearward motion of said upper basket relative to said lower basket and to prevent lateral motion of said upper basket relative to said lower basket.

4,113,330

HOLDER FOR DOCUMENTATION CARTRIDGE

Jerome M. O'Toole, Spartanburg, S.C., and Edmund T. Paquette, Shrewsbury, Mass., assignors to Wright Line Inc., Worcester, Mass.

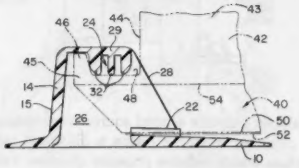
Filed Sep. 12, 1977, Ser. No. 832,729
Int. Cl.[2] A47B *63/00;* B42D *17/00*
U.S. Cl. 312—184 **17 Claims**

1. A holder for an elongate channel-form cartridge of the type adapted to support sheets of documents in a hanging position, said cartridge including a spine substantially coextensive with the closed portion of the cartridge channel and a pair of support hooks respectively extending beyond opposite transverse end walls of said channel, each of said hooks being open in the same direction as said channel and defining a slot extending transverse to said channel; said holder comprising:

an elongate flat base;

a ridge rising from said base defined by front and rear surfaces connected by a crest portion;

a chamber in said ridge defined between a pair of mutually spaced walls transverse to the long dimension of said base, said transverse walls being substantially perpendicular to



said base and extending forward from said rear surface to form an access opening through said front surface;

the roof of said chamber being formed by said crest portion and including an interiorly depending spline substantially parallel to said long dimension;

the base portion contained between said transverse walls including at least a pair of raised ribs transverse to said long dimension and including a notch therebetween; and

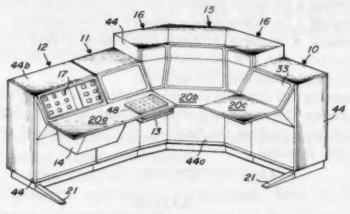
said holder being adapted to support said cartridge in a reversed position perpendicular to said long dimension such that said spine is disposed in said notch and one of said hooks engages said spline from below.

4,113,331

MODULAR CONSOLE ENCLOSURE WITH WRITING SURFACE

Terrence Edmund Derdzinski, Addision, Ill., and James Hilliard Karlin, Fairport, N.Y., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 9, 1975, Ser. No. 620,987
Int. Cl.[2] A47B *27/00, 53/00*
U.S. Cl. 312—198 **3 Claims**



1. A modular enclosure for housing apparatus and providing desk-type capability, the enclosure comprising:

vertical support members;

horizontal bracing members for attaching to the vertical support members;

panel members adapted for being exteriorly attached to the vertical members;

a V-shaped channel member having a first inward horizontal surface and another inward surface forming an acute angle with the first surface;

integral retaining brackets fixedly attached to one of the

inward surfaces of the V-shaped channel member, each bracket having a threaded aperture therein;

two wedge-shaped panel members each having a vertical edge and a structural member formed adjacent the vertical edge for mounting each panel member on one of said vertical support members, the panel members being adapted to support the V-shaped member in horizontal positioning between the outermost portions of the wedge-shaped members;

a rigid writing surface having a width equivalent to at least one module width;

frame means for supporting the writing surface, the inward ends of the frame means adapted to mate with the inward surfaces of said acute angle of the V-shaped member, frame means having apertures therein and positioned for being aligned with the apertures in the retaining brackets; and

fastener means adapted to cooperate with the apertures in the retaining brackets and the support frame means for attaching said support frame means to said retaining brackets of the V-shaped member, for retaining the inward ends of the frame means in abutting relationship with the surfaces of the acute angle of the V-shaped member.

4,113,332

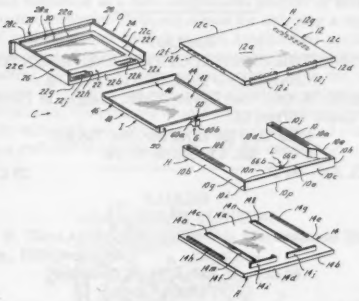
SECRET COMPARTMENT CASE

James David McMaster, P.O. Box 55791, Houston, Tex. 77055

Filed Oct. 19, 1977, Ser. No. 843,566

Int. Cl.[2] A47B *97/00, 17/04*

U.S. Cl. 312—204 **8 Claims**



1. A secret compartment case, comprising:

a flexible housing being movable from a normal position to a flexed position;

an outer drawer adapted to be disposed in said flexible housing and movable between an open position and a shut position with respect to said flexible housing;

an inner drawer adapted to be disposed substantially within said outer drawer and said flexible housing, said inner drawer mounted for movement with respect to said flexible housing between a secured position wherein said inner drawer is positioned within said flexible housing and not movable therefrom while said flexible housing is in a normal position and an unsecured position wherein said inner drawer is movable from said flexible housing when said flexible housing is in said flexed position and said outer drawer is displaced from said shut position; and, release means operatively connecting said inner drawer and said flexible housing for releasing said inner drawer from said flexible housing to allow movement from said secured position to said unsecured position.

4,113,333

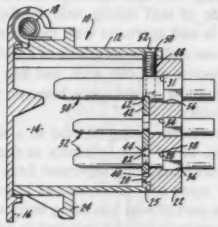
ELECTRICAL CONNECTOR RECEPTACLE

Charles Horowitz, Niles, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed May 23, 1977, Ser. No. 799,506

Int. Cl.[2] H01R *3/06*

U.S. Cl. 339—14 P **11 Claims**



1. In an electrical connector receptacle including a hollow housing having an end plate at one end and a closing cover at the opposite end, said end plate having a plurality of pin apertures extending therethrough, a plurality of male contact pins extending through said pin apertures and insertable from the outside of said end plate, cooperating means on said pins and pin apertures for limiting the extent to which said pins are inserted into said pin apertures, each of said pins having an annular groove, a locking plate positioned adjacent the inner wall of said end plate and slidable thereon, and means on said locking plate cooperating with the grooves in said pins for removably locking said pins in said pin apertures.

4,113,334

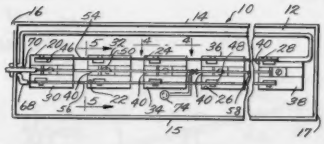
ELECTRICAL OUTLET STRIP

John C. Instone, Cherry Hill, N.J., assignor to SGL Industries, Inc., Haddonfield, N.J.

Filed Jul. 21, 1977, Ser. No. 817,849

Int. Cl.[2] H01R *9/00*

U.S. Cl. 339—22 R **11 Claims**



1. In combination a casing and at least two electrical outlet receptacles,

said receptacles all having live, neutral and ground terminals, all of the respective live, neutral and ground terminals of said receptacles being adapted to be connected into a parallel circuit,

said casing having a bottom with a corresponding number of apertures therein to receive said receptacles, and side and end walls to enclose a space therein into which said receptacles extend from said bottom, the casing having an open side opposite said bottom, there being a cover to complete the enclosure of the space inside the casing,

said receptacles being formed of an insulating body for supporting said terminals and having openings on one side that are exposed on the outside of the casing for receiving two and three pronged electrical plugs for connection to said terminals,

a three wire conductor for carrying an electrical current to said casing, said conductor having live, neutral and ground leads,

means for supporting each of said live, neutral and ground

terminal elements on said insulating bodies to extend beyond said bodies into said space in the casing so that said terminals are arranged in the same spaced apart positions one relative to the other on each of said insulating bodies and so that said ground terminal is intermediate said live and neutral terminals,

said insulating bodies being fitted into said bottom apertures of the casing with said openings for the plugs exposed to the outside of said casing, said insulating bodies being arranged in said apertures with like terminals of one kind adjacent one wall, like terminals of a second kind adjacent a wall opposite said one wall, and like ground terminals being positioned in said space between said live and neutral terminals,

all of said terminals being formed in a shape with spread apart arms, all of said terminals at the junctions of the spread apart arms being separated from one another by a relatively open and unobstructed space into which no significant part of said insulating body extends and

all of said terminals being supported in said space with the open arms facing said open side of the casing,

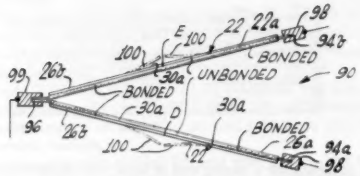
there being three separate bus wires adapted to be individually fitted between and attached to the open arms of the respective live, neutral and ground terminals when the cover of the casing is removed, said live and neutral terminals respectively being electrically connected to the live and neutral leads of said conductor and said ground lead having an electrical connection with the interconnected ground terminals and said casing.

4,113,335

RE-FORMABLE MULTI-CONDUCTOR FLAT CABLE

Roger J. Lang, and Gary E. Lang, both of Garden Grove, Calif., assignors to Eltra Corporation, Toledo, Ohio

Filed Oct. 28, 1976, Ser. No. 736,309
Int. Cl.² H01R *11/00*
U.S. Cl. 339—29 R **16 Claims**



1. A re-formable multiconductor cable, which comprises:

a pliable, longitudinally extending, plastic film; and

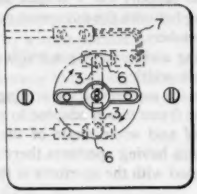
a plurality of longitudinally extending, laterally spaced insulated electrical conductors intermittently bonded to one surface only of said plastic film in segments of longitudinally extending peelably bonded areas alternating with segments of longitudinally extending non-bonded areas, the bond between said plastic film and insulated electrical conductors in said peelably bonded areas being of substantially lower tensile strength than that of the tear strength of said plastic film to thereby enable ready, complete separation of said plastic film from the conductor insulation to take place under the application of manual force within normal human limits, said non-bonded areas providing means for the formation of tear tabs usable for peeling of sections of said film across peelably bonded areas on opposite sides of said non-bonded areas.

4,113,336

SAFETY ELECTRIC RECEPTACLE AND THE PLUG

Luk Hon Man, Yung Ho Chen, Taipei Hsien, Taiwan

Filed Aug. 18, 1975, Ser. No. 605,767
Int. Cl.² H01R *13/54*
U.S. Cl. 339—75 P **2 Claims**



1. A safety electric receptacle and plug assembly comprising:

a plug comprising two knife blade conductors in a perpendicular position with said plug at its one end, a round head at said end and a square head behind closely said round head;

said two blade conductors pointing out between said round head and said square head toward opposite directions;

a receptacle comprising a bottom plate and a cover;

said bottom plate including two conductors in a symetrical arrangement for engaging said knife blade conductors when said plug is rotated;

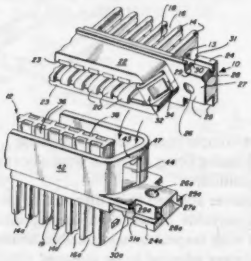
said cover includes an aperture for insertion of said plug into said aperture and for permitting rotation of the plug allowing insertion of said knife blade conductors into said bottom plate conductors.

4,113,337

CONNECTOR CONSTRUCTIONS AND MOUNTING MEANS AND HOODS THEREFOR

William H. McKee, West Covina, Calif., assignor to TRW Inc., Elk Grove Village, Ill.

Filed Oct. 29, 1976, Ser. No. 736,895
Int. Cl.² H01R *13/54*
U.S. Cl. 339—91 R **29 Claims**



1. In a ribbon connector assembly, the combination comprising a connector body of electrically insulating plastic having a plurality of wire-engaging contacts mounted therein, a member with which said connector is adapted to assume a fixed positional relation, and means for joining said connector body to said member; said connector body having opposed longitudinal end portions of lesser height than an interposed body portion in which said contacts are mounted; distal corners of each of said connector end portions being relieved to provide opposed lateral mounting ears and opposed abutment shoulders disposed inwardly of the connector distal ends adjacent

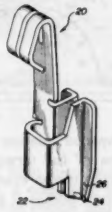
the inner ends of said ears; said joining means including spaced interlock elements for simultaneously slidably engaging each of said ears and for subsequently abutting said abutment shoulders to interlockingly engage said connector for attachment of said connector to said member with which said means are joined.

4,113,338

INSULATION-PIERCING CONTACT

Tedford Hollace Spaulding, Norridge, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jan. 3, 1977, Ser. No. 756,497
Int. Cl.[2] H01R *11/20*
U.S. Cl. 339—97 R **15 Claims**



1. A contact member for connection with an insulation-covered conductor comprising:

an active contact element; and

a terminal element adapted to pierce said insulation and electrically engage said conductor, said terminal element including insulation-cutting means for radially penetrating said insulation at a first longitudinal portion of said conductor, insulation-stripping means for stripping a segment of said insulation from a second longitudinal portion of said conductor and conductor-engaging means for contacting in wiping engagement substantially the entire length of said first and second longitudinal portions of said conductor, the portions of said terminal element contiguous with said conductor comprising smooth and continuous surfaces to prevent scoring of the conductor.

4,113,339

LOAD BREAK BUSHING

Edgar R. Eley, Athens, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 29, 1977, Ser. No. 828,467
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—111 **11 Claims**

1. A load-break bushing for a fluid filled electrical apparatus, comprising:

a tank;

an electrical element disposed within said tank;

a quantity of dielectric fluid disposed within said tank;

a hollow elongated housing having an axial passage extending therethrough, said housing having upper and lower portions, said upper portion extending through said tank to the outside thereof, said lower portion extending into said dielectric fluid within said tank;

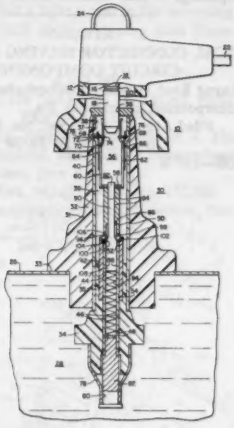
an electrical conductor, having first and second ends, disposed within said axial passage and adapted for movement therein between a first and second position;

a first electrical contact exteriorly movable relative to said housing;

said first end of said electrical conductor being adapted to engage said first contact;

a second electrical contact attached to said lower portion of said housing such that said second contact is surrounded by said dielectric fluid within said tank, said second contact being adapted to engage said second end of said electrical conductor in said second position and, further, being adapted for connection to said electrical element within said tank;

means for preventing movement of said electrical conductor from said first position until the engagement of said first contact with said first end of said electrical conductor to insure that the electrical circuit between said first contact,



said electrical conductor, said second contact and said electrical element is made within said dielectric fluid within said tank; and

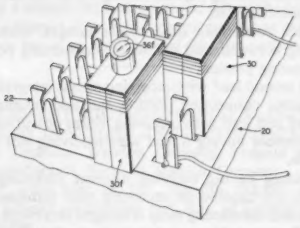
means for sealing said axial passage in said housing to prevent said dielectric fluid from entering therein such that said dielectric fluid surrounds only said second contact.

4,113,340

PROTECTIVE ELECTRICAL DEVICE

George M. Rapata, Schaumburg, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 27, 1977, Ser. No. 810,532
Int. Cl.[2] H01R *3/00*
U.S. Cl. 339—113 R **10 Claims**



1. A protective electrical device adapted for use with electrical wiring terminal blocks having adjacently positioned elongated metallic terminal means, said device including a substantially rigid dielectric body means, two contact means, and an electrical component means connected to said contact means, said body means consisting of a pair of body portions including a plurality of positioning means for separating and retaining said contact and component means in predetermined relationship as if in spaced chambers, positioning means in said chambers for cooperative retention of said contacts that fixes one end of each of said contacts and permits lateral adjustability of each of the opposite ends of said contacts, each of said contacts being provided with cooperative means adjacent said one end complementary to shoulder means serving as said positioning means in each said chamber adapted to locate and retain said contact in fixed axial relation to said body, a transverse cham-

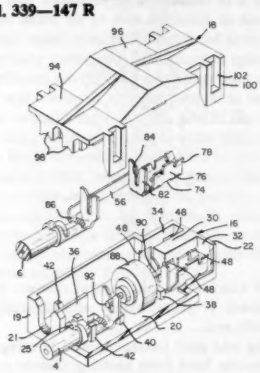
ber adjacent one end of said body means communicating with said contact and component means positions, and electrical connection means traversing said transverse chamber between said contact and component means, said body means further including spaced port means opening through said body means adapted with said contact means to accept a variety of predetermined spacings of said terminal means.

4,113,341

ELECTRICAL CONNECTOR HAVING PROVISION FOR CIRCUIT COMPONENTS

Donald Wayne Kent Hughes, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 12, 1977, Ser. No. 824,023
Int. Cl.[2] H01R *19/34*
U.S. Cl. 339—147 R **14 Claims**



1. An electrical connector means for disengageably connecting a conductor to an external terminal member and for optionally connecting a circuit component in series with said conductor, said connector means comprising:

an insulating housing,

a connector terminal member, said connector terminal member comprising a conductor connecting portion and a mating portion, said mating portion being dimensioned to be mated with said external terminal member, said conductor connecting portion having means for securing said conductor thereto,

removable connecting strap means integral with, and extending between, said conductor connecting portion and said mating portion,

first and second lead wire-receiving means integral with said conductor connecting portion and said mating portion, each of said lead wire-receiving means comprising a plate like member having a lead wire-receiving slot extending therein,

said housing having terminal member receiving portions which are capable of receiving said terminal member when said connecting strap is integral therewith and capable of separately receiving said conductor connecting portion said mating portion, and a circuit component positioned between said conductor connecting and said mating portions with the lead wires of said component received in said lead wire connecting means.

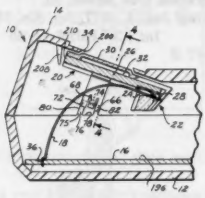
4,113,342

CONDUCTOR ARRANGEMENT AND ASSEMBLY METHOD

Joseph R. Andreaggi, Short Hills, N.J., assignor to Sangamo Weston, Inc., Newark, N.J.

Continuation of Ser. No. 675,931, Apr. 12, 1976, abandoned.
This application Oct. 11, 1977, Ser. No. 840,854
Int. Cl.[2] H01R *13/06*
U.S. Cl. 339—176 MP **18 Claims**

9. A conductor-connector assembly comprising a unitary metal electrical conductor assembly having flat, elongated, multiple, spaced apart conductor bodies in a common plane, a terminal tip at a common end of each of said multiple bodies, integral bridge means connected to each of said bodies at a location near its tip but between said conductor body and said terminal tip, said bridge means extending at an angle to the plane of said conductor bodies, each of said conductor bodies having a width substantially greater than its thickness so that the bodies are relatively stiff laterally, in their common plane, and flexible in a direction normal to their common plane, said bridge means providing means for maintaining said terminal



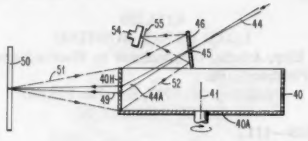
tips in predetermined spaced relation with respect to each other during association of the terminal tips with another terminal array, said bridge means extending at said angle to said plane of the conductor bodies at a location only slightly inwardly of the terminal tips, exposing said tips for simultaneous association with said another terminal array, and said bridge means being readily severable after association of the terminal tips with the terminals.

4,113,343

HOLOGRAPHIC OPAQUE DOCUMENT SCANNER

Robert Vladimir Pole, and Harald Willy Werlich, both of Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1977, Ser. No. 798,042
Int. Cl.[2] G02B *27/17, 5/32*
U.S. Cl. 350—3.71 **16 Claims**



1. An opaque document scanner comprising:

(a) a least one hologram constructed from a first reference beam ϕA and a object beam ϕB;

(b) means for illuminating a portion of said hologram with a cone of coherent light corresponding to a fraction $\Delta\phi A$ of said reference beam ϕA to reconstruct a scanning cone corresponding to a fraction $\Delta\phi B$ of said original object beam ϕB;

(c) means positioning said hologram relative to a document to be scanned so that the focal point of said reconstructed beam $\Delta\phi B$ is positioned substantially in the plane of said document to cause a reflected pattern of radiation from the point on said document being illuminated by said beam $\Delta\phi B$;

(d) a detector for providing electrical signals which vary corresponding to the amount of light energy focused on said detector; and

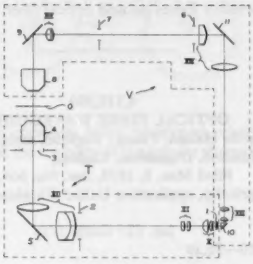
(e) means including said hologram for imaging said pattern of reflected radiation onto said detector.

4,113,344

MICROSCOPE ILLUMINATOR FOR BOTH TRANSMITTED AND VERTICAL MICROSCOPY

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 25, 1975, Ser. No. 607,842
Int. Cl.[2] G02B 21/06
U.S. Cl. 350—87 9 Claims



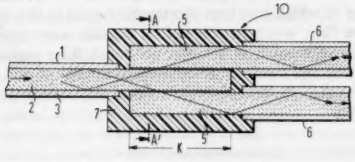
1. In a transmitted light microscope illumination system having a light source, a collecting lens system, a field diaphragm, a collimating lens system, and a condenser with a back aperture diaphragm all in alignment and in sequence along an optical axis, the improvement comprising a zoom lens system, between said collecting lens system and said field diaphragm, said zoom system consisting of first and second lens elements movable along said axis in unison, said first lens element being a convex-plano positive singlet and said second lens element being a plano-convex positive singlet and said first and second lens elements having adjacent plano surfaces.

4,113,345

BRANCHING ARRANGEMENT FOR COMMUNICATION TRANSMISSION LINKS HAVING OPTICAL GLASS FIBERS

Christian Gerndt, Geretsried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 26, 1975, Ser. No. 635,366
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1974, 2456619
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.15 6 Claims



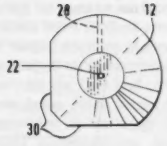
1. A branching arrangement for communication transmission links having a branching zone between overlapping end portions of an incoming cladded optical glass fiber and a plurality of outgoing cladded optical glass fibers, each of the glass fibers having a core enclosed in the cladding, said arrangement comprising each of the end portions of the glass fibers being completely free of the cladding in the area of the branching zone, a plurality of outgoing glass fibers being arranged with their cladding-free cores in a surrounding and overlapping relationship to the cladding-free core of the incoming glass fiber with the core of the incoming glass fiber being arranged with its axis parallel to the axis of each of the cores of the outgoing glass fibers, an intermediate material being disposed in the spaces between the overlapping cores of the incoming and the outgoing glass fibers, and a casing material surrounding the overlapping cores of all the glass fibers and the intermediate material, said casing material having an index of refraction n_U which is lower than the index of refraction of n_K of the cores and said intermediate material having an index of refraction n_Z which is approximately equal to the index of refraction n_K of the cores so that a light signal in the incoming glass fiber is transferred into each of the outgoing glass fibers.

4,113,346

METHOD OF MAKING OPTICAL FIBER TERMINATIONS

Thomas M. Jackson, Stortford, and Robert J. Hodges, Cheshunt, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,500
Claims priority, application United Kingdom, Nov. 20, 1975, 47764/75
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.20 3 Claims



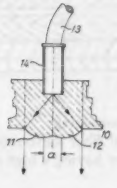
1. A method of making an optical fiber termination for use in a demountable optical fiber connector comprising the steps of:
providing an optical fiber having a core and a front end face;
securing the optical fiber in a ferrule to lie approximately along the ferrule axis;
locating the front end face of the fiber flush with one end of the ferrule;
directing light through the fiber from the end thereof opposite to said front end face to provide a visible reference point at the core of said fiber;
forming a first flat surface on the side of the ferrule a predetermined distance from said reference point; and
forming a second flat surface on the side of the ferrule at the same distance from said reference point as said first flat surface but at an angle to said first flat surface.

4,113,347

ARRANGEMENT FOR DIRECTIONAL RADIATION OF LIGHT IN SYMBOL-INDICATOR SYSTEMS

Waldemar Gaertner, Wenden, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 28, 1977, Ser. No. 782,187
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616298
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.24 9 Claims



1. In an arrangement for the directional radiation of light, in symbol-indicator systems which are to be effective over com-

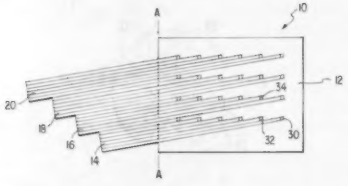
paratively great distances, with the symbols being formed by dots of a dot matrix, at which the ends of respective light-conductor-bundles terminate, and the opposite conductor ends of which may be illuminated by light sources, particularly for utilization as supplemental indicators in the railroad signalling field, the combination of a lens arrangement for each matrix dot, each of which comprises two horizontally adjacent lenses, each of which has a plane surface and a curved surface, with their plane surfaces facing the associated light conductor, and with the lenses of such lens arrangement being cooperably disposed to reproduce two horizontally adjacent partially superimposed light sources in the plane of observation.

4,113,348

CHANNEL ILLUMINATION SHEETS

George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Filed Aug. 13, 1976, Ser. No. 714,215
Int. Cl.[2] G02B 5/17
U.S. Cl. 350—96.25 8 Claims



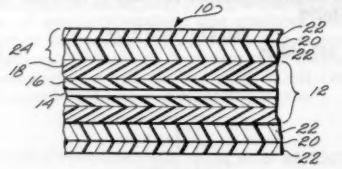
1. An illuminating sheet for illuminating microimages such as those carried by a microfiche, the sheet including,
(a) a supporting base,
(b) a transparent coating material of index of refraction n_1 on one surface of the base,
(c) a plurality of parallel strips of index n_2 of refraction, said strips positioned on the said coating of index n_1, the strips being spaced from each other so that they do not touch each other,
(d) a transparent filler of index n_3 of refraction covering said parallel strips,
(e) index n_2 being greater than either of indices n_1 or n_3,
(f) one end of each of the strips being biased and mirror finished to define a reflecting surface.

4,113,349

FIBER REINFORCED OPTICAL FIBER CABLE

Kenneth M. Stiles, San Dimas, Calif., assignor to Air Logistics Corporation, Pasadena, Calif.

Filed Jul. 30, 1975, Ser. No. 600,202
Int. Cl.[2] G02B 5/16
U.S. Cl. 350—96.23 16 Claims



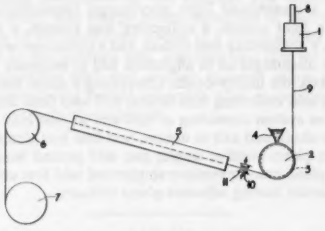
1. An optical cable comprising:
(a) an elongate optical fiber surrounded by a coating of a cured silicone rubber having a high coefficient of thermal expansion; and
(b) an outer shell surrounding the cured silicone rubber coating, said outer shell composed of a plurality of reinforcing fibers bound by a set resin, the resin being set when said coating of cured silicone rubber is in a thermally expanded state and said outer shell having a coefficient of thermal expansion less than the coefficientof thermal expansion of said cured silicone rubber coating wherein the ratio of coefficients of thermal expansion of the cured silicone rubber coating to said outer shell is from about 3:1 to about 30:1, said outer shell being substantially constrained by said cured silicone rubber coating when in its thermally non-expanded state from imparting radial compressive forces on said optical fiber.

4,113,350

OPTICAL FIBRE WAVEGUIDES

Ernest Martin Haines, Pinner, England, assignor to Telephone Cables Limited, Dagenham, England

Filed Mar. 8, 1976, Ser. No. 664,706
Claims priority, application United Kingdom, Mar. 18, 1975, 11192/75
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.29 8 Claims



1. An optical fibre waveguide consisting of a glass fibre having a composition and structure such that the refractive index of the fibre material varies over the cross-section of the fibre, and provided with a continuous surface coating of synthetic resin material, wherein the said coating is formed of a plurality of layers each from 3 to 5 micrometers in thickness, applied to the glass fibre sucessively as resin solutions and each cured before the application of a succeeding layer, and wherein at least the innermost layer of said coating consists of a thermosetting resin containing a dispersion of finely powdered, non-metallic, inorgainc filler material the modulus of elasticity of which is at least substantially equal to that of the said glass fibre, which powdered filler material is incorporated in said resin solution as a suspension, each filler containing layer of the said coating consisting of 10 to 45% of said filler material and 90 to 55% of the fully cured thermosetting resin, by weight.

4,113,351

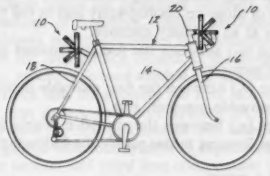
SAFETY REFLECTOR DEVICE FOR BICYCLES OR THE LIKE

John V. Kitrell, 1830 N. 49th, Lincoln, Nebr. 68504

Filed Oct. 7, 1976, Ser. No. 730,695
Int. Cl.[2] G02B 5/12
U.S. Cl. 350—99 4 Claims

1. A safety reflector device, comprising,
a plurality of substantially U-shaped members having first and second ends, said members having a light reflective surface on the outer surface,
first connection means connecting the first ends of said U-shaped members,

second connection means connecting the second ends of the said U-shaped members,



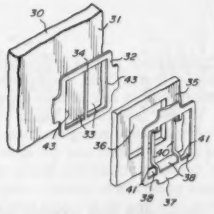
said U-shaped members being positioned relative to each other so that the majority of the lengths thereof are spaced apart.

4,113,352

ELECTRO-OPTIC MATRIX DISPLAY

Hugo Willy Schafft, Des Plaines, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1977, Ser. No. 756,216
Int. Cl.² G02F *1/03*
U.S. Cl. 350—150 **10 Claims**



1. An electro-optic display device for selectively transmitting light comprising:

an electro-optic plate operable in the transverse bias mode;

a plurality of first conductors, located on a side of the plate, each first conductor having a plurality of predeterminedly spaced apertures provided therein;

an insulating layer superposed over said first conductors and having provided apertures substantially coincident with the apertures of the first conductors; and

a plurality of second conductors insulated from said first conductors by said insulating layer, said second conductors being generally superjacent to and crossing said first conductors, each of said second conductors having a plurality of apertures substantially coincident with predetermined apertures of the first conductor, each of said second conductors having contacting portions extendingg from each second conductor and lying on said side of the plate in predetermined electrical configuration with predetermined ones of said first conductors;

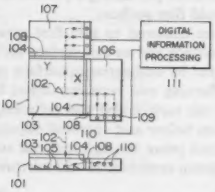
whereby a predetermined area of the electro-optic plate is adapted to be selectively activated in the transverse bias mode by application of an electric potential between selected ones of the first and second conductors.

4,113,353

INFORMATION PROCESSING OPTICAL DEVICE

Akira Matsushita, Kawasaki, Japan

Continuation of Ser. No. 495,491, Aug. 7, 1974, abandoned. This application Dec. 2, 1976, Ser. No. 746,830
Claims priority, application Japan, Apr. 20, 1974, 49-43908; Apr. 20, 1974, 49-43909
Int. Cl.² G02B *27/14*
U.S. Cl. 350—171 **4 Claims**



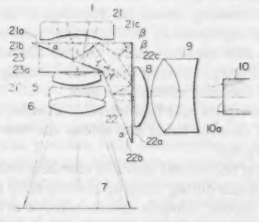
1. An information processing optical device which comprises: a body having on a major surface thereof a number of discrete spot-like beam input sections arranged in the form of a matrix, and beam output sections in first and second groups with said groups arranged on separate end surfaces of the body in correspondence with the lines and columns of the spot-like beam input sections; beam guide means of a material different than said body provided in the body for each individually optically connecting corresponding individual beam input sections with both a corresponding one of the output sections in the first group and a corresponding one in the second group and including beam-dividing means comprising means having reflecting surfaces integral therewith for separating and independently transmitting individual beam input signals of radiant energy from the discrete, spot-like beam input sections in the lines and columns of said matrix to the beam output sections in the first and second groups as two independent beams representative of directions representative of X and Y directions for specifying the position of the corresponding individual input beams in X and Y coordinates; first and second optical encoders provided respectively in correspondence to the individual beam output sections in the first and second groups; and beam input terminals on the optical encoders optically connected to the respective beam output sections in the first and second groups.

4,113,354

SINGLE-LENS REFLEX OPTICAL SYSTEM FOR AN ENDOSCOPE

Nobuo Yamasita, Tama, and Toshihiro Imai, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Mar. 1, 1977, Ser. No. 773,408
Claims priority, application Japan, Mar. 3, 1976, 51-22080
Int. Cl.² G02B *27/14*; G03B *19/12*; A61B *1/04*
U.S. Cl. 350—172 **27 Claims**



1. A single-lens reflex optical system for an endoscope comprising:

a photographing optical system for focusing an image of an object to be observed on a film surface;

a first prism having an entrance surface and a mirrored surface for reflecting object light received through said entrance surface by, sequentially, said mirrored surface and said entrance surface of said first prism;

said mirrored surface having a small hole arranged close to the position of the aperture stop of said photographing optical system for permitting a portion of said object light to pass to said film surface;

a second prism centered to said first prism and having a reflecting surface and an exit surface for receiving object light reflected by said entrance surface of said first prism and for reflecting said received object light by, sequentially, said exit surface and said reflecting surface of said second prism before said received object light passes out of said second prism through said exit surface;

a correcting prism cemented to said mirrored surface of said first prism;

an image guide having an end face; and

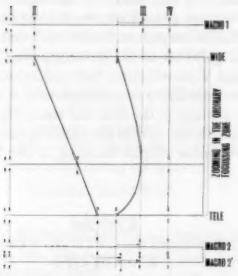
an observing optical system disposed near said exit surface of said second prism for focusing the object light passing out of said exit surface of said second prism into said image guide face.

4,113,355

MACRO ZOOM LENS

Sadahiko Tsuji, Kanagawa, and Yujiro Agari, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 585,654, Jun. 10, 1975, abandoned.
This application Dec. 5, 1977, Ser. No. 857,692
Claims priority, application Japan, Jun. 17, 1974, 49-68883
Int. Cl.[2] G02B *15/18*
U.S. Cl. 350—184 **3 Claims**



1. A macro zoom lens capable of taking close-up photography, at the edge of the wide and tele-side of the zooming zone, comprising:

focusing means, zooming means, and fixed image forming means arranged in the written order from an object side, said focusing means for focusing at an ordinary photographing distance, said zooming means including a first movable member and a second movable member, said fixed image forming means for focusing a light flux from said zooming means on a film;

at least one of said first movable member and second movable member being movable at the time of close-up photography;

said first and second movable members being within a zooming space during close-up photography in which said first and second movable members move at the time of zooming;

said first and second movable members being positioned at a position in said zooming space at the time of a close-up photograph from the wide edge and being positioned at a different position in said zooming space at the time of close-up photography from the tele-edge;

wherein the distance between said focusing means and the image forming means being substantially constant both at the time of close-up photography and at the time of photography at an ordinary distance,

the distance (e_1) between the focusing means and the first movable member,

the distance (e_2) between the first movable member and the second movable member, and

the distance (e_3) between the second movable member and the image forming means satisfy the following conditions:

e_1 min $\leqq e_1$ macro

e_2 min $\leqq e_2$ macro

e_3 min $\leqq e_3$ macro

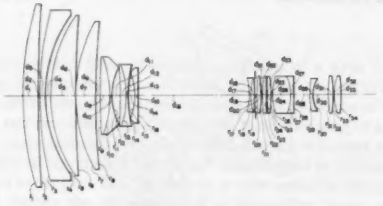
in which, e_1 min, e_2 min and e_3 min signify a minimum value of the distance e_1, e_2, e_3 respectively in the zooming state in an ordinary focusing zone, and e_1 macro, e_2 macro and e_3 macro signify a distance e_1, e_2 and e_3 respectively at the time of the close-up photography.

4,113,356

ZOOM LENS SYSTEM WITH HIGH ZOOMING RATIO

Masaki Matsubara, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Apr. 19, 1977, Ser. No. 788,961
Claims priority, application Japan, Apr. 20, 1976, 51-45212; Apr. 20, 1976, 51-45213
Int. Cl.[2] G02B *15/18*
U.S. Cl. 350—186 **22 Claims**



1. A zoom lens system with high zooming ratio comprising a focusing lens group, variator lens group, compensator lens group, erector lens group and master lens group, said focusing lens group comprising three positive lens components and one negative lens component, said variator lens group comprising three negative lens components, said compensator lens group comprising a negative cemented doublet lens component, said erector lens group comprising two positive lens components, said master lens group comprising a first, second, third and fourth lens components, said first lens component having positive refractive power, said second lens component having negative refractive power, said third lens component being a positive lens, said fourth lens component being a positive lens, said zoom lens system with high zooming ratio satisfying the following conditions:

$$1.45 < N_a < 1.65 \quad (1)$$

$$1.57 < N_b < 1.82 \quad (2)$$

$$|3f_v < R_a \quad (3)$$

$$0.05\, f_M < D_a < 0.36\, f_M \quad (4)$$

$$0.24\, f_M < D_b + D_c < 0.6 f_M \quad (5)$$

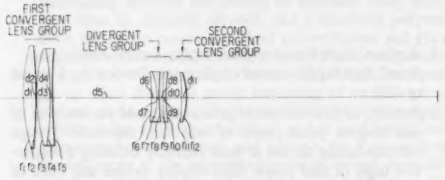
wherein reference symbol N_a represents refractive indices of positive lenses in the focusing lens group (but, refractive indi-

ces of those lenses may be different from each other), reference symbol N_b represents refractive indices of two lenses on the object side in the variator lens group (but, refractive indices of the two lenses may be different from each other and, when one or both of those lenses are cemented doublets, N_b represents refractive indices of negative lenses constituting those cemented doublets), reference symbol R_a represents the radius of curvature of the lens surface closest to the image side in the variator lens group, reference symbol D_a represents the thickness of the thick lens constituting the first lens component in the master lens group, reference symbol D_b represents the airspace between the first and second lens components in the master lens group, reference symbol D_c represents the airspace between the second and third lens components in the master lens group, reference symbol f_V represents the focal length of the variator lens group, and reference symbol f_M represents the focal length of the master lens group.

4,113,357
TELEPHOTO LENS SYSTEM

Soichi Nakamura, Kamakura, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Dec. 8, 1975, Ser. No. 638,708
Claims priority, application Japan, Dec. 28, 1974, 50-1298
Int. Cl.[2] G02B *13/02, 9/60, 9/62, 9/64*
U.S. Cl. 350—212 **14 Claims**

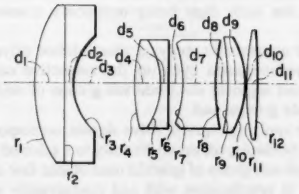


1. A telephoto lens system comprising, in the order as viewed from the object side, a first convergent lens group movable along the optical axis of the system, a divergent lens group movable along the optical axis of the system and a second convergent lens group stationary for focusing, said first convergent lens group and said divergent lens group forming substantially an afocal system for an object at infinite distance, and focusing upon a nearer object being attained by the movement of one of said first convergent lens group and said divergent lens group to lengthen the air space therebetween.

4,113,358
RETROFOCUS TYPE WIDE-ANGLE PHOTOGRAPHIC LENS SYSTEM

Jihei Nakagawa, Higashimurayama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 6, 1975, Ser. No. 629,606
Claims priority, application Japan, Nov. 9, 1974, 49-128557
Int. Cl.[2] G02B *11/30*
U.S. Cl. 350—216 **3 Claims**



1. A retrofocus type wide-angle photographic lens system comprising a first negative cemented doublet lens component, a second positive cemented doublet lens component, a third negative lens component, a fourth positive meniscus lens component and a fifth positive lens component, and said wide-angle photographic lens system having the following numerical data:

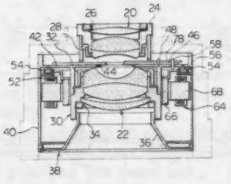
$r_1 = 0.89501$		
$d_1 = 0.19296$	$n_1 = 1.72$	$\nu_1 = 42.1$
$r_2 = 12.63956$		
$d_2 = 0.05513$	$n_2 = 1.51633$	$\nu_2 = 64.2$
$r_3 = 0.38615$		
$d_3 = 0.40384$		
$r_4 = 1.17183$		
$d_4 = 0.15409$	$n_3 = 1.8061$	$\nu_3 = 40.9$
$r_5 = 0.55000$		
$d_5 = 0.05513$	$n_4 = 1.69895$	$\nu_4 = 30.1$
$r_6 = 17.11794$		
$d_6 = 0.09648$		
$r_7 = -0.81932$		
$d_7 = 0.23073$	$n_5 = 1.80518$	$\nu_5 = 25.4$
$r_8 = 2.53199$		
$d_8 = 0.03584$		
$r_9 = -3.16141$		
$d_9 = 0.12818$	$n_6 = 1.757$	$\nu_6 = 47.9$
$r_{10} = -0.59818$		
$d_{10} = 0.00276$		
$r_{11} = 1.77635$		
$d_{11} = 0.08270$	$n_7 = 1.757$	$\nu_7 = 47.9$
$r_{12} = -5.55394$		

$f = 1.0$, $f_B = 1.06413$, F/2.0
$f_{4,5} = 0.621$, $\Sigma d = 0.53643$

4,113,359
AUTOMATIC DIAPHRAGM ASSEMBLY

Hiroshi Koike, No.5-10,1-Chome, Minami-Azabu, Minato-ku, Tokyo; Shoji Suzuki, No.17-7-104,3-Chome, Satagaya, Setagaya-ku, Tokyo, and Takeki Asakawa, No. 556, 4-Chome, Taisei-cho, Ohmiya City, Saitama Prefecture, all of Japan

Filed Mar. 16, 1977, Ser. No. 778,240
Int. Cl.[2] G05D *25/00*
U.S. Cl. 350—269 **15 Claims**



1. An automatic diaphragm assembly for an image pick-up device having lens systems, comprising a stationary support structure supporting said lens systems and including a flange formed with a substantially circular opening having a center axis therethrough, a plurality of diaphragm blades rotatable about respective axes disposed substantially symmetrically about said center axis, said diaphragm blades forming therebetween a variable aperture having maximum and minimum areas and a center axis substantially in line with the center axis of said opening, at least one neutral-density filter element rotatable about one of said respective axes of rotation of said diaphragm blades between an angular position located in its entirety out of said variable aperture when the diaphragm blades are in positions having the variable aperture enlarged to the maximum area and an angular position fully intercepting said variable aperture when the diaphragm blades are in positions having the variable aperture reduced to the minimum area, a ring-shaped permanent magnet having a center axis substantially in line with the center axis of said opening and having pole portions which have opposite polarities alternately disposed circumferentially of the magnet, a ferromagnetic ring positioned in substantially coaxial relationship to said permanent magnet and

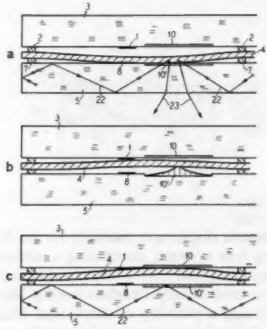
having a plurality of limb portions respectively terminating in end portions which are substantially regularly spaced apart from each other circumferentially of the ring and which have end faces located close to said permanent magnet, said limb portions consisting of a plurality of groups each consisting of three limb portions one of said permanent magnet and said ferromagnetic ring being fixedly held in position with respect to said support structure and the other thereof being rotatable about the center axis of said permanent magnet and in driving engagement with said diaphragm blades and said neutral-density filter element, and two coils carried on each of said groups, one of the two coils being wound on one pair of neighboring limb portions in each of said groups and the other of the two coils being wound on the other pair of neighboring limb portions in each of said groups, the coils on each of said groups being wound in the opposite directions to the coils on the neighboring groups.

4,113,360

INDICATING DEVICE FOR ILLUSTRATING SYMBOLS OF ALL KINDS

Güenter Baur, Freiburg, and Waldemar Greubel, Denzlingen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 28, 1977, Ser. No. 782,186
Int. Cl.² G05D *25/00*
U.S. Cl. 350—285 **10 Claims**



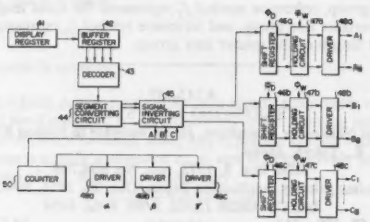
1. An indicating device for projecting symbols of all kinds comprising a plate of fluorescing synthetic material, said plate having metallized edges to create a light trap for fluorescent light created in the plate; a layer of light dispersing material mounted in spaced relationship to a surface of said plate; a contact film disposed in at least selected areas between the layer and said plate; and means for selectively moving portions of the layer into optical contact with the contact film and plate to cause decoupling of the fluorescent light from said plate, said means including a plurality of electrodes disposed in the device in a given pattern and means for selectively applying electrical voltage of the electrodes to create a selected arrangement of electrical fields to move desired portions of the layer into contact with the plate to create a display of a desired symbol.

4,113,361

LIQUID CRYSTAL DISPLAY DEVICE

Harumi Nakano, Kunitachi, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1976, Ser. No. 654,725
Claims priority, application Japan, Feb. 4, 1975, 50/14554
Int. Cl.² G02F *1/13*; G08B *5/36*
U.S. Cl. 350—332 **16 Claims**



1. A plural digit liquid crystal display device comprising:

a plural digit liquid crystal display panel including a liquid crystal;

a plurality of first electrode groups disposed on one side of said display panel, each of said first electrode groups corresponding to and at least partially defining a respective digit of said plural digit display device and each of said fist electrode groups including a plurality of segment electrodes;

a plurality of second electrode groups disposed on the side of the display panel opposite to the side on which said first electrode group is disposed, each of said second electrode groups corresponding to and at least partially defining a respective digit of said plural digit display device and each of said second electrode groups including a plurality of segment electrodes;

said electrodes of said first electrode groups being in exact correspondence with said electrodes of said second electrode groups;

each of said first electrode groups being grouped into a plurality of first sub-groups of segment electrodes, said segment electrodes of each first sub-group of segment electrodes being commonly connected together;

each of said second electrode groups being groups into a plurality of second sub-groups of segment electrodes which are different in configuration from said first sub-groups of segment electrodes, said segment electrodes of each second sub-group of segment electrodes being commonly connected together and corresponding second sub-groups of electrodes of each of said second electrode groups for each digit being commonly connected together;

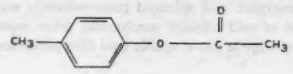
means for sequentially applying phase-shifted drive signals of a predetermined cycle to the respective commonly connected segment electrode sub-groups of said second electrode groups; and

means for applying segment drive signals, corresponding to data to be displayed, simultaneously to a selected segment electrode sub-group of selected ones of said first electrode groups in synchronism with and concurrently with said application of a respective phase-shifted drive signal to effect a data display.

4,113,362
LIGHT VALVE, LIGHT VALVE SUSPENSION MATERIALS AND SUSPENSION THEREFOR

Robert L. Saxe, New York; Robert I. Thompson, Plainview, and Matthew Forlini, Ozone Park, all of N.Y., assignors to Research Frontiers Incorporated, Plainview, N.Y.

Continuation-in-part of Ser. No. 604,410, Aug. 13, 1975, Pat. No. 4,025,163. This application May 11, 1977, Ser. No. 795,819
Int. Cl.[2] G02B 5/23
U.S. Cl. 350—362 29 Claims

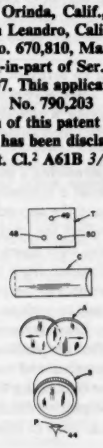


1. A light valve comprising:
a cell
means associated with said cell for applying an electric field thereto, and
an electrically responsive liquid suspension in said cell including:
a plurality of suspended particles which are responsive to an electric field to change the transmission of radiation through the suspension, and
a suspending medium that includes the combination of a suspending material comprising an aromatic ester derivable from an aromatic alcohol, and a dissolved polymer from the group consisting of (a) nitrocellulose and (b) a copolymer that includes at least two different monomers, at least one of which includes an unhindered functional group taken from the group consisting of an OH group and an acidic group, at least one of said monomers being soluble in the suspending medium, and at least one of said monomers being branched, and wherein the distance from the backbone to the available functional group most distant from the backbone in one monomer is less than the distance from the backbone to a non-functional group in another monomer, which combination acts to maintain the suspension of suspended particles, when an electric field is applied, in substantially the same condition of dispersion as in the absence of the electric field.

4,113,363
PROCESS AND APPARATUS FOR ASTIGMATIC AND SPHERICAL SUBJECTIVE TESTING OF THE EYE

William E. Humphrey, Orinda, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

Continuation of Ser. No. 670,810, Mar. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 452,232, Mar. 18, 1974, Pat. No. 3,947,097. This application Apr. 25, 1977, Ser. No. 790,203
The portion of the term of this patent subsequent to Mar. 30, 1993, has been disclaimed.
Int. Cl.[2] A61B 3/02
U.S. Cl. 351—17 15 Claims

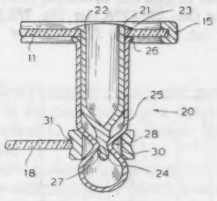


1. A process for determining optometric prescription for the eye in at least one astigmatic component including the steps of: providing a patient viewing station; providing a first line target of first arbitrary preselected angular alignment without regard to any suspected principal axis of the patient's eye to a view path from said patient viewing station at least to said target, said first line target including small angular divergence in the range of up to 20° from said arbitrary angular alignment; providing in said view path a constant power cylinder between said patient viewing station and said first target in the range of 1 to 6 diopters aligned normally to said first arbitrary preselected angular alignment; providing in said view path variable astigmatic optics for varying astigmatic lens power along first intersecting diagonals at substantially equal and opposite angles from the preselected angular alignment of said first line target; said first variable astigmatic optics varying said astigmatic power from positive to negative along one axis of said first intersecting diagonals, and from negative to positive along the other axis of said first intersecting diagonals; and, varying the first variable astigmatic optics responsive to subject patient visual acuity of said first line target to obtain a first component of astigmatic prescription for said patient.

4,113,364
SUNGLASS METHOD AND APPARATUS

Manlio V. Dussich, 383 N. Atlantic Ave., Cocoa Beach, Fla. 32931

Filed Aug. 1, 1977, Ser. No. 820,570
Int. Cl.[2] G02C 7/12, 1/00; G03B 1/00
U.S. Cl. 351—49 10 Claims



1. A variable density polarizing attachment for spectacles having polarizing lenses therein comprising in combination:
a pair of polarizing lenses;
a plurality of lens holding posts attachable to each lens of a pair of spectacles, said posts being grooved to rotatably retain said polarizing lens lenses; and
means for attaching each said holding post to said eyeglasses in predetermined position to rotatably support each said polarizing lens in said post groove adjacent to each spectacle lens including each of said plurality of lens holding posts having first and second post members, said second post member being adatped to lock said first and second post members together to lock said post to said lens to such spectacles whereby light transmission through said spectacles can be varied by rotating said attached polarizing lens.

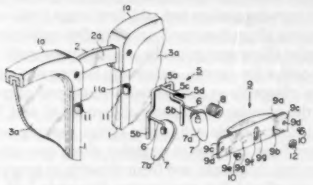
4,113,365
SPECTACLES' FRAME WITH VERTICALLY ADJUSTABLE NOSE PADS

Sotoichi Koketsu, 13 Fukigecho 6 chome, Gifu-shi, Gifu-ken 500 Japan

Filed May 20, 1976, Ser. No. 688,480
Int. Cl.[2] G02C 7/06, 5/12
U.S. Cl. 351—128 2 Claims

1. A spectacle frame comprising: a pair of encircling portions for the insertion of lenses therein; a bridge connecting said encircling portions; a pair of bows; a lifting member movable at the back of said bridge; and a pair of vertically adjust-

able nose pads at lower ends of said lifting member; a lifting member being further defined by legs turning downwardly on both sides of a base having said nose pads attached to said legs by arms; said base having a horizontal lever at its center, and extending rearwardly therefrom, said lever being provided with threads; a spring fitted to said lever; guides fixed to the back of said encircling portions below said bridge employing



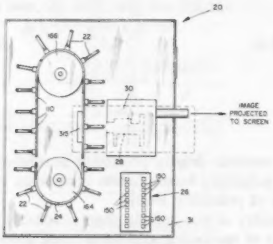
means defining a guide hole for inserting lower portions of said legs for vertical movement; a cover having a bottom wall affixed to said encircling portions at respective end portions, having a vertically elongated means defining a hole adapted to receive said lever therethrough; notches symmetrically formed on the bottom wall of said cover for receiving said legs; said cover lodging said lifting member and part of said spring; and fastening means positionable around said threads.

4,113,366

FILM PROJECTION SYSTEM

Ernest Glover, 309 E. 91st St., Brooklyn, N.Y. 11212

Filed Dec. 29, 1976, Ser. No. 755,132
Int. Cl.[2] G03B *31/00, 21/04*
U.S. Cl. 352—8 **8 Claims**



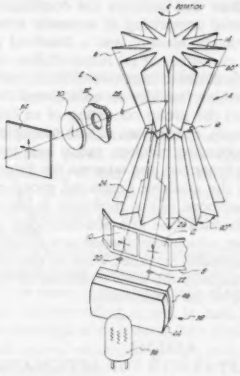
1. A sound film projections system comprising a displaceable film storage magazine, means for displacing said storage magazine, a plurality of discrete sound film cartridges mounted in said magazine, each of said cartridges containing a sound film program containing visual images and a sound track, a film projection adapted to receive one of said plurality of cartridges from said film storage magazine and to reproduce said sound film program contained in said one cartridge, a selector system, a transfer means adapted to remove said one cartridge from said storage means and position it within said film projector, said selector system including actuating means to manually actuate said storage magazine displacement means so that said one cartridge selected is positioned adjacent said transfer means, said transfer means being actuated to transfer said one cartridge from said film storage magazine to said film projection, means associated with said film projector adapted to activate said film projector upon the positioning of said cartridge therein to reproduce said sound film program contained in said one cartridge, and cuing means adapted to deactivate said film projector upon completion of said program and adapted to activate said transfer means to return said one cartridge to said film storage magazine upon completion of said sound film program, said transfer means including at least a first arm and a second arm, said arms being in telescoping orientation, a carriage for supporting said arms, said carriage being slidably mounted on a base, clamp members on said first arm adapted to engage said one cartridge, a transfer mechanism drive motor, means in said selector system to energize said transfer mechanism drive motor when said actuating means is manually actuated, so that said first arm is displaced and said clamp members engage the one cartridge, said transfer mechanism drive motor thereafter displacing said first and second arms on said carriage until said transfer mechanism drive motor is de-energized, a solenoid, said solenoid having a shaft connected to said carriage, and means in said selector system to energize said solenoid concomitantly with the de-energization of said transfer mechanism drive motor so that said one cartridge is place within said film projector.

4,113,367

ROOF REFLECTIVE POLYGON SCANNING APPARATUS

Ulrich M. Fritzler, 65-15 Booth St., Rego Park, N.Y. 11374, assignor to Ulrich M. Fritzler, New York, N.Y.

Filed Sep. 9, 1976, Ser. No. 721,892
Int. Cl.[2] G03B *41/02*
U.S. Cl. 352—105 **31 Claims**



1. An optical scanner apparatus for the reflective modification of a transmission energy beam relative to an adjacent position comprising:

a first member having an array of roof reflective members with a 60° included angle between each reflective surface;

a second member having a plurality of a roof reflective member with a 90° included angle between each reflective surface, and

mounting means for permitting a movement of the first and second members about a common axis, the first member reflective surfaces and the second member reflective surfaces mounted to reflect the energy beam three times on the first member and two times on the second member wherein d_3 is the distance from the common axis of the first and second members to the position, d_2 is the distance from the common axis to a plane containing the reflected transmission energy beam between the first member and second member reflective surfaces and d_1 is the distance between the first member and second member reflective surfaces in the plane containing the reflected transmission energy beam, the respective distances being related for an air equivalent optical path as follows:

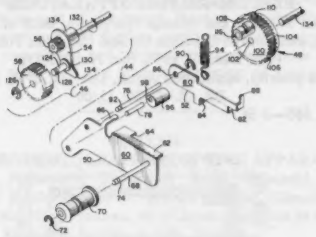
$$d_3 = 2d_2 - d_1$$

4,113,368

AUTOMATIC LOWER LOOP RESTORER MECHANISM

Albert J. Feltz, Rochester, and Howard C. Deck, Henrietta, both of N.Y., assignors to The Singer Company, New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,913
Int. Cl.[2] G03B 1/56
U.S. Cl. 352—159 6 Claims



1. A loop restoring mechanism for use in combination with a movie film projector having a film gate thru which film is incrementally driven, a sound drum around which the film is continuously driven, and a pre-defined film loop path therebetween comprising:

a pivotally mounted control arm having a film engaging element connected thereto;

said control arm having an initial park position which locates said film engaging element on the interior side of said film loop path;

said conrol arm pivotable from said park position to an extended position to cause said film engaging element to pull film from said film gate;

a rotatably mounted loop set gear having a crank pin extending therefrom;

said crank pin engageable with a surface portion of said control arm to cause said control arm to pivot from said park position to said extended position and back to said park position thereby causing said film engaging element to pull said film from said film gate;

drive means selectably engageable and disengageable with said loop set gear to cause said loop set gear to rotate and thereby cause said control arm to pivot from said park position to said extended position and back to said park position;

trigger means associated with said control arm and said loop set gear to cause said drive means to engage said loop set gear and pivot said control arm when said film loop is lost.

4,113,369

MOTION PICTURE PROJECTOR

Kuniyoshi Suzaki, Machida; Akira Ashida, Yokohama; Takashi Itani, Kandaiji; Tateo Yamada, Yokohama; Masaya Maeda, Kawasaki; Kiyoshi Takahashi, Kunitachi, and Hiroyuki Takimoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1976, Ser. No. 736,223
Claims priority, application Japan, Oct. 31, 1975, 50-131114; Oct. 31, 1975, 50-131115; Oct. 31, 1975, 50-131116
Int. Cl.[2] G03B 1/22
U.S. Cl. 352—194 10 Claims

1. A motion picture projector capable of using movie film and of selecting various modes of operation, comprising:

(a) a housing having a film path therein and an image reproducing location for reproducing an image present on the film passing along the film path;

(b) a projection light source in said housing arranged in relation to the film passing along the film path within the image reproducing location;

(c) an optical projection means in said housing arranged in a position corresponding to the projection light source sandwiching the film path in the image reproducing location therebetween:

(d) a film feeding means in said housing for intermittently transporting the film passing along the film path in the image reproducing location, including:

a pull-down claw means engageable with the film at the image reproducing location;

a rotary cam means for actuating the pull-down claw, and including:

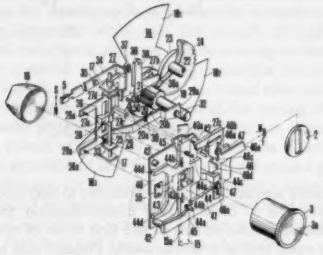
a first cam means for cyclically engaging the film to said claw means; and

a second cam means for reciprocating said claw means along the film path;

a first coupling means for coupling said first cam means and said claw means; and

a second coupling means for operatively coupling said second cam means and said claw means;

(e) a slow motion picture projection control means in said housing, including:



a slow motion picture projection cam means for engaging the film to the cam means at a slower cycle than the cycle applied to said claw means by said first cam means; and

a third coupling means for forcibly operatively coupling said slow motion picture projection cam means between said first coupling means and said first cam means; and

(f) a change-over means accessible on the exterior of said housing for forcibly blocking said claw means from selective engagement with the film and for operatively coupling said first coupling means and said claw means; including

a first mode cam means for operating said first coupling means and said claw means; and

a second mode cam means for inactivating said first coupling means and said claw means and preventing said claw means and said film from engaging each other, thus allowing still picture projection.

4,113,370

OPTICAL SYSTEM FOR ALTERNATIVELY PROJECTING ADJACENT IMAGES OF ADJACENT OBJECTS OR DOUBLE IMAGES OF A SINGLE OBJECT

John Alan Durbin, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,865
Int. Cl.[2] G03B 21/00
U.S. Cl. 353—122 2 Claims

1. An optical system for alternatively projecting an image of a full object field in a first mode of operation and projecting a plurality of images of a partial object field in a second mode of operation, including:

an object station defining an object field, said object field disposed within an integrating illumination cavity defined by an enclosure having a diffuse reflective inner member,

an image station defining an image field,

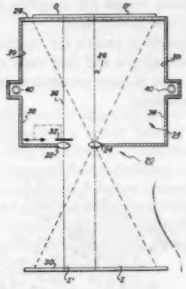
a first projection lens disposed on a first optical axis between said object and image stations,

said object and image fields being respectively in object and image conjugate relationship to said first projection lens,

a second projection lens disposed on a second optical axis between said object and image stations,

a first part of said object field and a first part of said image field being respectively in object and image conjugate relationship to said first projection lens,

said first part of said object field and a second part of said image field being respectively in object and image conjugate relationship to said second projection lens,



a shutter operatively disposed relative to said second projection lens to close optical communication through said second projection lens in said first mode of operation and to open optical communication through said second projection lens in said second mode of operation, and

a field stop operatively disposed in said image field and movable between a clear position to permit unobstructed optical communication between said object station and said image station in said first mode of operation and a masking position to mask out a second part of said object field in said second mode of operation.

4,113,371

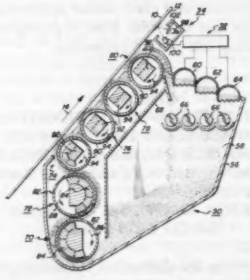
COLOR DEVELOPMENT SYSTEM

Lawrence J. Fraser, and Alan Liebman, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 12, 1977, Ser. No. 758,538

Int. Cl.² G03G *15/01*

U.S. Cl. 355—4 **18 Claims**



1. An apparatus for developing a latent image recorded on a receiving member, including:

means for storing a supply of particles:

means for dispensing a plurality of differently colored particles into said storing means, said dispensing means discharging the particles therefrom in a pre-selected ratio to form a mixture of particles in said storing means having a pre-selected resultant color; and

means for depositing the mixture of differently colored particles on the latent image recorded on the receiving member.

4,113,372

PHOTOSENSITIVE SCREEN DRUM FOR ELECTROGRAPHIC APPARATUSES

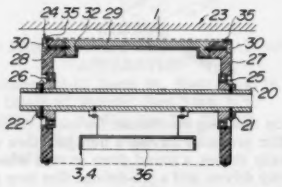
Katsuhiko Kimura, and Masaji Nishikawa, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,839

Claims priority, application Japan, Dec. 23, 1975, 50-152877

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 SC **4 Claims**



1. A photosensitive screen drum for electrographic apparatuses comprising: a casing; a fixed shaft secured to said casing; a cylindrical supporting body composed of a pair of insulating discs rotatably mounted on said fixed shaft and spaced apart from each other, and an electrically conductive supporting member secured at its both ends to said insulating discs, said electrically conductive supporting member being formed into an arcuate segment having at least an inner surface thereof with an insulating coating formed thereon; and a photosensitive screen wound around said cylindrical supporting body and secured at both ends thereto; said supporting member being formed of the same material and having the same thermal expansion coefficient as said photosensitive screen.

4,113,373

COPYING APPARATUS

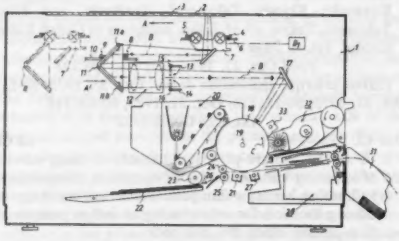
Rudolf Eppe, Taufkirchen; Günther Schnall, Eching; Ludwig Müllritter; Johann Beck, both of Munich, and Karl Hartwig, Unterhaching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Jun. 24, 1976, Ser. No. 699,341

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1975, 2528925

Int. Cl.² G03G *15/28*

U.S. Cl. 355—8 **6 Claims**



1. A copying apparatus, comprising first means for supporting an original to be copied; second means having a photosensitive surface for receiving an image thereon; third means for scanning said original and transmitting image-forming light

beams from said first means along a path to said second means; and fourth means for varying the amount of light which reaches said surface, comprising a pair of baffles pivotally mounted symmetrically relative to said path, and means for synchronously moving said baffles into and out of said path along which said light beams are transmitted, including a control member accessible exteriorly of said apparatus for selectively moving said baffles, and a Bowden linkage interconnecting said control member and said baffles, said Bowden linkage comprising a Bowden line and a sheath surrounding the same over part of the length thereof, said sheath having two end portions; and further comprising means arrestably mounting one of said end portions on said apparatus for displacement relative to the other end portion of a plurality of positions.

4,113,374

ELECTROPHOTOGRAPHIC COPYING APPARATUS

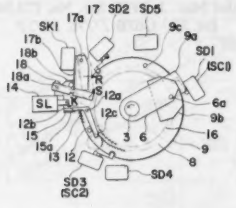
Yoshihiro Nakamura, Toyokawa; Kenji Shibazaki, Aichi; Tateomi Kono, Toyokawa; Syotaro Inagaki, Okazaki, and Tomoji Murata, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Azuchi, Japan

Filed Oct. 27, 1976, Ser. No. 736,189

Claims priority, application Japan, Oct. 29, 1975, 50-130732

Int. Cl.[2] G03G *21/00*

U.S. Cl. 355—14 **10 Claims**



1. In an electrophotographic copying apparatus for effecting a series of copying operations which comprises a photoreceptor drum having a photoreceptor surface disposed on an outer periphery thereof, said photoreceptor surface having a discontinuity at a portion thereof, corona charging means for preliminarily charging said photoreceptor surface, exposure means for exposing said preliminarily charged photoreceptor surface to light images of an original to be copied through light rays transmitting means so as to form an electrostatic latent image of said original on said photoreceptor surface, scanning means for scanning a surface of said original, developing means for developing the electrostatic latent image formed on said photoreceptor surface into a visible toner image, transfer means for transferring said visible toner image onto transfer material transported following rotation of said photoreceptor drum, separation means for separating the transfer material from said photoreceptor surface after the transferring of said visible toner image onto the transfer material, and fixing means for fixing said visible toner image transferred onto the transfer material to said transfer material thus separated from said photoreceptor surface, an improvement of said electrophotographic copying apparatus which comprises:

means for initiating rotation of said photoreceptor drum;

a drum cam which rotates as one unit with the rotation of said photoreceptor drum;

a control cam coaxial with said drum cam which rotates independently of the rotation of said drum cam;

a first group of switches including at least a first switch, a second switch and a third switch disposed on the circumference of rotation of said drum cam for actuation by said drum cam;

a second group of switches including at least a first switch and a second switch disposed on the path of the transfer material for actuation by passage of the transfer material, said first switch being adapted for connection to said corona charging means, said scanning means and said exposure means for actuation of said corona charging means, said scanning means and said exposure means when actuated, and said second switch being actuated upon discharge of the transfer material out of said copying apparatus during normal operation;

a third group of switches disposed on the circumference of rotation of said control cam for actuation by said control cam;

a control cam rotation driving means associated with said control cam and coupled to said first switch of said second group of switches for starting rotation of said control cam with a rotational period less than the rotational period of said drum cam when said first switch of said second group of switches is actuated and for stopping the rotation of said control cam after one revolution; and

a transfer material feeding means coupled to said first, second and third switches of said first group of switches and said first and second switches of said second group of switches, for starting to feed the transfer material to said copying apparatus when said first switch of said first group of switches is actuated, for continuing to feed the transfer material to said copying apparatus when said second switch of said first group is actuated after said first switch of said second group is actuated, for ceasing to feed the transfer material to said copying apparatus when said second switch of said first group of switches is actuated without actuation of said first switch of said second group of switches and for ceasing to feed the transfer material to said copying apparatus when said third switch of said first group of switches is actuated without actuation of said second switch of said second group of switches.

4,113,375

POWER REGULATING DEVICE FOR CONTROLLING EXPOSING MEANS AND FIXING MEANS IN ELECTROPHOTOGRAPHIC COPYING APPARATUS

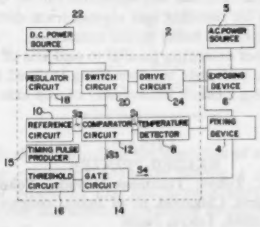
Tomoji Murata, Toyokawa, and Kenji Shibazaki, Aichi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Nov. 10, 1976, Ser. No. 740,725

Claims priority, application Japan, Nov. 13, 1975, 50-155035[U]

Int. Cl.[2] G03G *15/00*

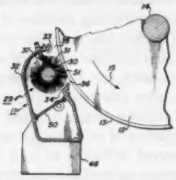
U.S. Cl. 355—14 **18 Claims**

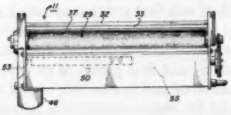


1. An improved control means in an electrophotorgraphic copying apparatus having an exposing means provided with a lamp element for exposing an original to be copied, an operating means for operating said exposing means, a fixing means provided with a heating element for heating a copy material for fixing thereon a pattern of said original and a control means for controlling the electric power to be supplied to said fixing means in accordance with the variations of temperature in said fixing means, said control means comprising a power limiting means which limits said electric power to a predetermined level during the operation of said exposing means when said electric power to be supplied to said fixing means in accor-

dance with said variations of said temperature in said fixing means is greater than said predetermined level.

4,113,376
CLEANING APPARATUS FOR REPRODUCING MACHINE
John C. Rodda, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed May 25, 1977, Ser. No. 800,581
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—15 **14 Claims**





1. In a cleaning apparatus for removing residual material from an imaging surface comprising:

a rotary cleaning means for removing said residual material, said cleaning means being arranged for rotation about a given axis; a housing for supporting said cleaning means; and

means for providing a vacuum air flow through said housing and about said cleaning means in order to collect said residual material removed by said cleaning means, said vacuum air flow providing means including a vacuum port arranged adjacent one side of said housing which would create an asymmetric variation in the pressure and velocity of the air flow about said cleaning means from one side of said housing to an opposing side thereof; the improvement wherein said apparatus further comprises;

baffle means for reducing said asymmetrical distribution of said air flow, said baffle means comprising;

a plate member extending parallel to said axis of said cleaning means, said plate member being inclined away from said cleaning element transversely of said axis.

4,113,377
READER-PRINTER
Yoshiaki Sone, Tokyo; Takamasa Sawada, Yokohama, and Masanari Shirai, Chigasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 617,238, Sep. 26, 1976, Pat. No. 4,054,379. This application Jun. 14, 1977, Ser. No. 806,515
Claims priority, application Japan, Sep. 28, 1974, 49-111845
Int. Cl.[2] G03B *13/28*
U.S. Cl. 355—45 **24 Claims**

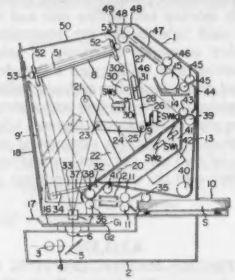
1. A reader-printer comprising:

a housing having a viewing opening formed therein;

means for projecting an image to be read and printed along a light path formed in said housing;

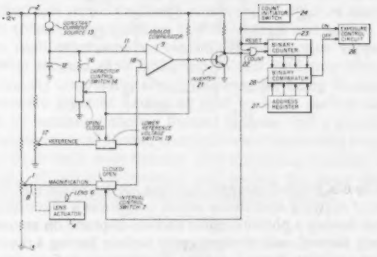
screen means for displaying said projected image for observation through said viewing opening, said screen means being movable between a first position in said light path and a second position outside said light path;

means for conveying a reproduction material into said light path for exposure by said projected image; and



means for selectively admitting and blocking the admission of external light through said viewing opening.

4,113,378
LINEAR EXPOSURE CONTROL SYSTEM
John Stanley Wirtz, Henrietta, N.N.Y., assignor to Itek Corporation, Lexington, Mass.
Filed Mar. 2, 1977, Ser. No. 773,568
Int. Cl.[2] G03B *27/76, 27/52*
U.S. Cl. 355—55 **13 Claims**



1. In an exposure control system for varying the exposure of an object to be photographed in linear fashion as a function of changes in magnification of the image of said object focused upon a photo-sensitive medium, the improvement comprising:

a. movable lens means;

b. a lens actuator for mechanically changing the position of said lens means for producing changes in magnification;

c. magnification signal generating means for producing a magnification signal proportional to the position of said lens actuator;

d. integration signal generating means for producing an integrated signal upon being actuated having a linear slope regardless of variations of said magnification signal;

e. reference signal generating means;

f. comparator means for assuming a first state when the signal applied to one input terminal thereof is greater than the signal applied to the other input terminal thereof, and for assuming a second state when the signal applied to the one input terminal thereof is less than the signal applied to the other input terminal thereof, said comparator means connected to compare the amplitudes of the signal produced by said integration signal generating means and said magnification signal generating means during a first interval and comparing the signal produced by said integration signal generating means and said reference signal generating means during a second interval, output pulses being produced by said comparator for each change of said comparator from said first state to said second state;

g. switch means coupling said integration signal generating means and said magnification signal generating means to said comparator during a first interval and deactuating said integration signal generating means while coupling said reference signal generating means to said comparator during a second interval for referencing said integration signal generating means, thereby to cause said comparator to revert from said second state back to said first state and for thereafter causing said comparator to again compare the signal produced by said magnification signal generating means with the signal produced by said integrator; and

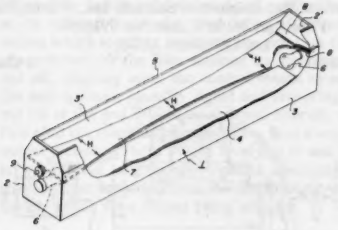
h. counter means for counting the pulses produced by said comparator and for producing an output signal when the count thereof reaches a predetermined value, said output signal being utilized to terminate said exposure of said object.

4,113,379

ILLUMINATION APPARATUS FOR ELECTRONIC COPYING MACHINES

Masaaki Harada, and Tsuguto Fujita, both of Ebina, Japan, assignors to Rank Xerox, Ltd., London, England

Filed Jul. 18, 1977, Ser. No. 816,773
Int. Cl.[2] G03B *27/54, 27/76*
U.S. Cl. 355—71 **3 Claims**



1. Illumination apparatus for use in a reproduction machine, said apparatus comprising:

a casing having an elongated opening in one wall thereof;

illumination means disposed at opposite ends of said casing; and

means supported intermediate said elongated opening and said illumination means to preclude direct emission of illumination from said opening, said means being shaped so as to provide a substantially uniform distribution of illumination along said elongated opening,

said means for precluding direct emission of illumination comprising a screen plate having the shape of a bow tie.

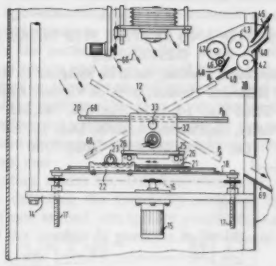
4,113,380

FEEDING AND ELECTROSTATIC HOLDING ORIGINALS IN A COPYING MACHINE

Karl Walter, Penzberg, Fed. Rep. of Germany, assignor to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,971
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638695
Int. Cl.[2] G03B *27/62;* **B65H** *9/08, 11/02*
U.S. Cl. 355—75 **12 Claims**

1. In a copying machine provided with means for performing an exposure operation by illuminating an original to be copied and projecting the image of the illuminated original onto copying material, in combination, an original carrier mounted to receive on its surface an infed original and support the original, the original carrier comprising a carrier plate, an electrically conductive metal plate atop the carrier plate, a layer of acrylic glass atop the metal plate, and atop the glass plate an angled member of electrically conductive metal having two legs extending along two edges of the original carrier for positioning the edges of originals to be copied; and holding means operative for holding an original flat on the carrier plate during the exposure operation by means of electrostatic holding force, including means operable when an original contacts



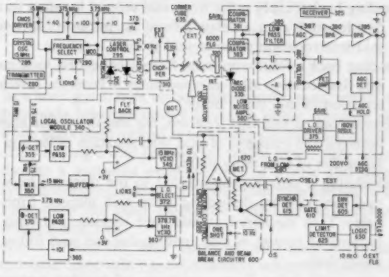
the angled member for establishing between the metal plate and the metal angled member a potential difference in the kilovolt range and disestablishing the potential difference for removal of the original from the original carrier upon performance of the exposure operation.

4,113,381

SURVEYING INSTRUMENT AND METHOD

James Stephen Epstein, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 18, 1976, Ser. No. 742,941
Int. Cl.[2] G01C *3/08;* **G01B** *11/26*
U.S. Cl. 356—5 **6 Claims**



4. A method of controlling the operation of an electro-optical distance measuring apparatus having a photo-sensitive receiver for producing first and second electrical signals in response to first and second light beams respectively, comprising the steps of:

amplifying the first and second electrical signals by a selected amplification factor;

producing a first detect signal in response to the first electrical signal attaining a value outside a first predetermined range;

producing a second detect signal in response to the second electrical signal attaining a value outside a second predetermined range, the first range being larger and including the values of the second range;

selectably regulating the intensity of one of the light beams for substantially equalizing the values of the first and second electrical signals; and

selecting the amplification factor in response to the presence

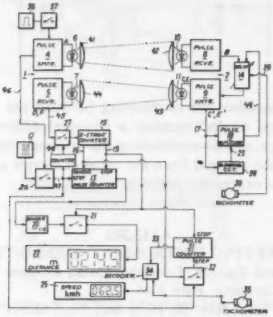
of a second detect signal to alter the value of the second electrical signal to substantially equal a predefined value.

4,113,382

METHOD OF AND SYSTEM FOR MEASURING DISTANCES

Otto Freudenschuss, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Dec. 10, 1976, Ser. No. 749,333
Claims priority, application Austria, Dec. 12, 1975, 9443/75
Int. Cl.[2] G01C *3/08*; G01S *9/56*
U.S. Cl. 356—5 **5 Claims**



1. A method of measuring the distance between a first location and a second location, comprising the steps of:

sending an interrogation pulse from said first location to said second location;

sending back a reply pulse from said second location to said first location after a delay T from the instant of arrival of said interrogation pulse at said second location;

sending back a follow-up pulse from said second location to said first location after an equal delay T from the instant of emission of said reply pulse;

determining, at said first location, the length of time elapsed between the emission of said interrogation pulse and the reception of said reply pulse;

calculating a time τ proportional to the distance between said locations by deducting from said elapsed time the delay T as measured at said first location between the instants of arrival of said reply pulse and said follow-up pulse; and

varying said delay T as a measure of another parameter whose magnitude is to be communicated from said second location to said first location.

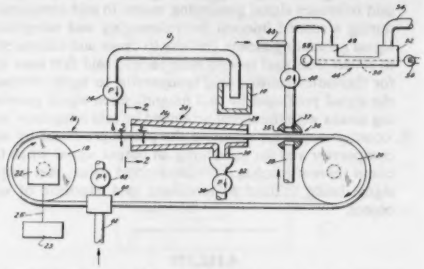
4,113,383

METHOD AND APPARATUS FOR SOLUTE TRANSFER

Donald Arthur Burns, Putnam Valley, and Henry Fontanilles, Fishkill, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,558
Int. Cl.[2] G01N *1/00, 21/26*
U.S. Cl. 356—36 **14 Claims**

1. Apparatus transferring a substance from a first to a second liquid stream, comprising: means flowing said first stream from a source to a first station and depositing it upon a conveyor movable from said first station to a second station, means to move said conveyor, means flowing said second stream to said second station to pick up said substance, means to flow said deposited first stream along at least a portion of the conveyor



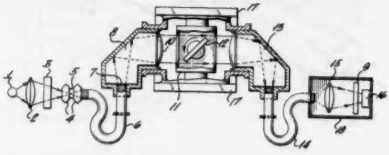
from said first station toward said second station, and means to actuate said conveyor-moving means.

4,113,384

VISCOSITY MEASURING SYSTEM

James L. Lauer, Penn Wynne, and Melvin E. Peterkin, Brookhaven, both of Pa., assignors to Suntech, Inc., Wayne, Pa.

Filed Apr. 26, 1977, Ser. No. 791,089
Int. Cl.[2] G01N *33/28*
U.S. Cl. 356—70 **3 Claims**



1. A method for measuring the viscosity of a lubricant fluid under very high pressures by placing a sample of lubricant contaning one or more rube crystals in a diamond anvil cell illuminated with a point source of visible light radiation, observing the rate of change of the width at half-height of the R_1 fluorescence band of the ruby emission spectra at given temperatures and pressures and correlating said change with an empirical calibration of a fluid of known viscosity under the same conditions.

4,113,385

TRANSIENT SUPPRESSOR NETWORK FOR SPECTROPHOTOMETERS AND THE LIKE

Michael Alan Ford, 7 Islet Park House, Islet Park, Maidenhead, Buckinghamshire; Henry Manifold Mould, 82 Hazelmere Rd., Penn, Buckinghamshire, and Dieter Kolb, Boyne House, Grove Rd., Beaconsfield, Buckinghamshire, all of Great Britain

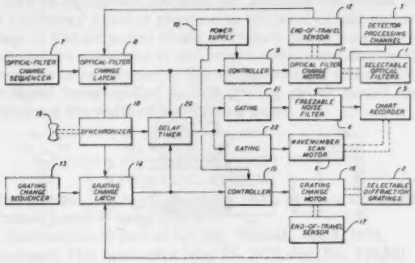
Filed Jan. 6, 1977, Ser. No. 757,204
Claims priority, application United Kingdom, Jan. 7, 1976, 00425/76
Int. Cl.[2] G01J *3/42*; G01D *9/00*; H03H *7/10*
U.S. Cl. 356—96 **20 Claims**

1. In an apparatus having a plurality of operational elements adapted to cooperate for producing an electrical signal representing variations of an ordinate quantity with respect to an abscissa quantity changing at a controlled rate, at least one of said elements being subject to an adjustment during the evaluation of said variations that is capable of causing spurious transients to appear in said signal, an electrical filter for filtering

said signal, and a utilization device responsive to the output of said filter, means for substantially excluding said spurious transients from the filter output comprising:

(a) control means for interrupting the generation of the ordinate quantity signal related to abscissa change and for cutting off the filter for an operational time interval including the duration of said adjustment and additional time sufficient to allow said spurious transients to die away;

(b) storage means associated with said filter and operatively related to said control means during said operational time



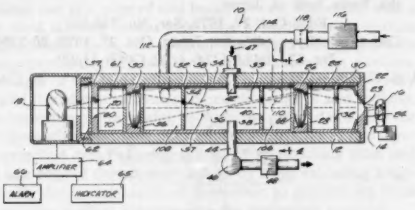
interval for holding the output level reached by the filter at cut off and for storing a plurality of electrical signal values which together represent the point on the impulse characteristic of the filter attained by the filter output at cut off, whereby upon the control means re-establishing the said ordinate quantity signal and removing the filter cut off at the end of said operational interval, and therefore after the spurious transients have died away, the filter output is restored both to said level and to said point as if no cut off had taken place, with the result that spurious transients are excluded from the filter output without the fidelity of the filter output being affected.

4,113,386

PHOTOMETER

James M. Lepper, Jr., Redlands, Calif., assignor to Climet Instruments Company, Redlands, Calif.

Filed Sep. 20, 1976, Ser. No. 725,027
Int. Cl.[2] G01N *21/00, 21/26*
U.S. Cl. 356—103 **11 Claims**



1. A forward light scattering photometer comprising

an elongate housing;

a light source for providing a beam of light along an axial path through said housing;

first and second axially spaced, spherical-surfaced, bi-convex lenses located inside said housing and disposed coaxially with said axial path, said lenses providing axial focusing of an image of said lamp on said axial path with radial aberrations and substantially no circumferential aberrations;

a first light trap located in said housing adjacent the upstream side of said first lens, said first light trap including a light-absorbing area and a light-transmitting area, the border between said areas extending radially in a straight line relative to said axial path so as to form an image with sharp radial edges at the focal region between said lenses;

means for introducing a fluid sample containing particles through said focal region;

a second light trap located inside said housing adjacent the upstream side of said second lens, said second light trap having light-absorbing and light-transmitting areas which are complementary to those of said first light trap whereby the portion of the light beam passing through said focal region and not scattered by the sample particles is absorbed on the light-absorbing area of said second light trap and the portion of the light beam passing through said focal region and scattered forwardly by the sample particles passes through the light-transmitting area of second light trap; and

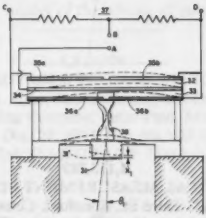
light detecting means located downstream of said second lens for detecting the forwardly scattered light passing through said second lens and for producing a signal indicative of the number of particles in the sample.

4,113,387

DUAL MODE LASER OPTICS CONTROL FOR RING LASER GYRO

Sidney G. Shutt, Brea, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 14, 1977, Ser. No. 768,511
Int. Cl.[2] G01B *9/02;* G01P *9/00*
U.S. Cl. 356—106 LR **10 Claims**



1. In a laser gyro, laser optics adjustment means comprising

a duo-mode bimorph device having a single common electrode plate sandwiched in an axially stacked dual bimorph array having a first and second coded input, each responsive to a mutually exclusive one of a first and second synchronously detected photodetector laser output of said laser gyro for laser amplitude and frequency control, respectively; and

a mirror within the laser optics of said laser gyro being mounted upon said bimorph device, whereby closed-loop control of said laser optics is effected.

4,113,388

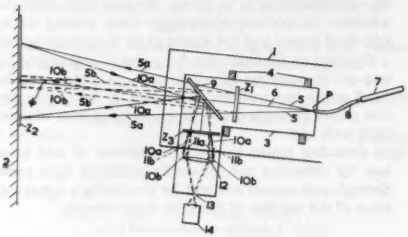
OPTICAL APPARATUS FOR DETERMINING RELATIVE POSITIONING OF TWO MEMBERS

John William Charles Gates, East Molesey; Roy Geoffrey Noel Hall, Teddington; Ian Norman Ross, Marcham, and Richard Frederick Stevens, Ashford, all of England, assignors to National Research Development Corporation, London, England

Filed Jun. 25, 1976, Ser. No. 700,037
Int. Cl.[2] G01B *9/02, 11/04*
U.S. Cl. 356—110 **13 Claims**

1. An optical apparatus for monitoring the relative positioning of first and second members which are movable relative to each other, the apparatus comprising radiation means for generating an optical wavefield which provides, over a given area which has a predetermined location relative to the first member when the first member is in a given position relative to the second member, a distinctive light intensity distribution resulting from at least two wavefronts that differ from each other in

curvature in each of two mutually orthogonal planes; and fiducial means for interacting with the wavefield when the first member is in the vicinity of said given position to produce an interference pattern whose form is indicative of the displacement of the first member from said given position, the fiducial means comprising an optical element which is fixed relative to



the second member in a location which coincides with said predetermined location when the first member is in said given position relative to the second member, the optical element having a structure representative of the light intensity distribution in the wavefield over at least one area which at least approximately corresponds in position to a least part of said given area.

4,113,389

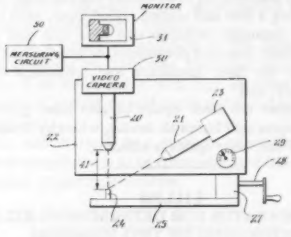
OPTICAL MEASUREMENT SYSTEM

Morton Kaye, 122 Third St., Stamford, Conn. 06905

Filed Apr. 19, 1976, Ser. No. 678,059

Int. Cl.[2] G01B *9/04, 11/00*

U.S. Cl. 356—164 **9 Claims**



1. An apparatus for measuring a dimension of an object, comprising stage means for receiving siad object, a microscope viewing assembly positioned to view an object on the stage means on a first optical axis, projection means mounted to focus a knife edge image on said object on said stage means along a second optical axis, the light-dark transition of said image extending normal to the plane defined by said first and second optical axes, means relatively displacing said microscope viewing assembly along said first optical axis with respect to said stage means, measuring means for indicating displacement of said microscope assembly on said first optical axis, and means mounting said projection system for movement with said microscope assembly.

4,113,390

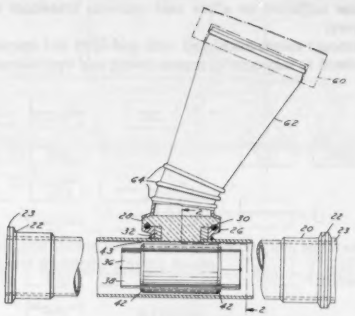
OPTICAL SIGHT TUBE FOR FLUID CONDUITS

Walter E. Levine, Port Huron, Mich., assignor to Bindicator Company, Port Huron, Mich.

Filed Mar. 14, 1977, Ser. No. 777,433

Int. Cl.[2] G01N *21/26*

U.S. Cl. 356—201 **12 Claims**



7. Apparatus for optically measuring a preselected characteristic of fluids flowing in a confined path comprising a cylindrical conduit disposed to define at least a portion of said confined fluid path, means providing an optical window in a wall of said conduit, means for optically detecting said material characteristic through said window, and reflective means including a hollow tube and means mounting said tube within said conduit to position an outer reflective surface of said tube adjacent said window and define a test material flow path between said surface and said window and a bulk material flow path remote from said window, said reflective means being adapted to reflect a measurement optical beam incident upon said surface through said window and test material back through test material and said window.

4,113,391

METHOD FOR CONTROLLING VOLTAGE AND PROVIDING TEMPERATURE COMPENSATION IN A THERMAL PRINTER

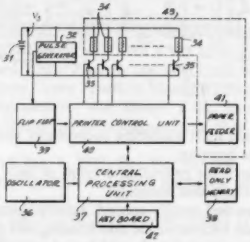
Masahiro Minowa, Shiojiri, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Suwa, both of, Japan

Filed Oct. 27, 1976, Ser. No. 736,046

Claims priority, application Japan, Oct. 27, 1975, 50-129019

Int. Cl.[2] B41J *1/24, 3/20;* **G08B** *23/00*

U.S. Cl. 400—120 **14 Claims**



1. An apparatus for controlling a thermal printer having a plurality of exothermic printing elements and adapted to be energized for printing by a current pulse produced in response to the output voltage of a power source, comprising driving circuit means for selectively applying driving pulses to said exothermic elements and control circuit means connected for

detection of said power source output voltage and operatively coupled to said driving circuit means for adjusting the width of the driving pulses applied to said exothermic printing elements in response to the level of said power source output voltage so that the width of said driving pulses is increased in response to a decrease in said output voltage and is decreased in response to an increase in said output voltage, said control circuit means including a pulse generation circuit operably couplable to receive said power source output voltage for producing an oscillatory signal, said pulse generation circuit including voltage sensitive means including a varistor independent of said plurality of exothermic elements for adjusting the period of said oscillatory signal in response to the level of said output voltage so that the period of said oscillatory circuit is increased in response to a decrease in said output voltage and decreased in response to an increase in said output voltage, said oscillatory signal being applied to said driving circuit means for determining the width of said driving pulses.

4,113,392

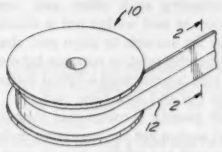
PRINTING RIBBON

Walter Ploeger, Jr., North Bellmore, N.Y., assignor to Filmon Process Corp., Westbury, N.Y.

Continuation-in-part of Ser. No. 485,641, Jul. 3, 1974, abandoned. This application May 19, 1975, Ser. No. 578,581

Int. Cl.[2] B41J *31/02*

U.S. Cl. 400—240.1 **6 Claims**



1. A printing ribbon comprising a longitudinally extending printing portion and a longitudinally extending correction portion joined thereto, said printing portion being the thickest portion of said ribbon and having a thickness not more than about 0.0035 inches, said printing portion being only a single thickness of inked fabric without any backing, said correction portion including a backing carrying thereon a layer of correction material whose width is narrower than the width of the backing, one side edge of said backing being connected with a butt weld directly to one side edge of said printing portion longitudinally along the ribbon, said weld being the only means interconnecting said printing and correction portions, side edges of the layer of correction material being generally parallel to and spaced from said one side edge of said backing, said correction portion lying between the planes defined by the side faces of said printing portion, and a side edge of said layer of correction material being spaced by said backing from said one side edge of the printing portion by a gap extending longitudinally down the middle of the ribbon to prevent ink from the printing portion bleeding into the correction material.

4,113,393

APPARATUS FOR MEASURING CASTER AND CAMBER IN MOTOR VEHICLES

Udo Kiefer; Wolf von Loeben, and Friedrich Wilhelm Schulz, all of Karlsruhe, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

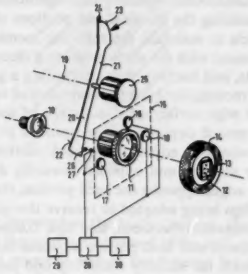
Filed Mar. 31, 1977, Ser. No. 783,407

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614374

Int. Cl.[2] G01B *11/275*

U.S. Cl. 356—155 **17 Claims**

1. In an apparatus for measuring caster and camber in a motor vehicle including a mirror which is mountable on the respective hubs of the vehicle wheels and the normal to which mirror is directed parallel to the wheel axles of the vehicle; a projector disposed opposite the mirror; and a projection surface including a plurality of light-sensitive detectors for detecting images of horizontally-vertically oriented shutters disposed in the ray path of the projector reflected by the mirror; the



improvement comprising said shutters comprising measuring edges of rotatable arms disposed in an object plane of the projector, the angles of rotation of the arms between a reference position and a position of the arms at which an image of one of said measuring edges is reflected by said mirror onto at least one of said detectors being used as a measurement of the caster and camber angles of the wheels of said vehicle.

4,113,394

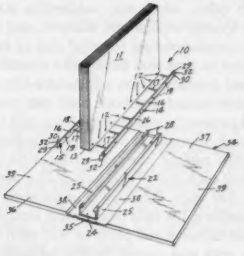
REMOVABLE BINDING DEVICE

Joe D. Giulie, Los Altos, Calif., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 23, 1975, Ser. No. 625,131

Int. Cl.[2] B42F *3/00, 13/12*

U.S. Cl. 402—46 **2 Claims**



1. A binding device for a stack of sheets having a plurality of spaced perforations along a spine edge surface of the stack, said device comprising;

first and second polymeric rake-like members, each rake-like member comprising an elongate rail having first and second opposite major elongate surfaces, and a plurality of spaced aligned studs projecting normally from the first surface of said rail, and a plurality of spaced sockets in the first surface of said rail, said second surface of said rail being smooth throughout its length for the portion opposite said studs and sockets, each stud having a base end attached to said rail and an opposite frustoconical terminal end, substantially all of said sockets opening through only the first surface of said rail adapted to receive terminal end portions of the studs on the other of said rails to afford mutual engagement therebetween providing a ladder-like assembly with said rails in spaced, parallel relationship

and to maintain said studs in alignment, said rake-like members being adapted to engage a said stack of sheets from opposite sides with said studs extending through the perforations and into said sockets to form said ladder-like assembly;

an elongate polymeric backing strip defining channels with opposed open sides adapted to slidably receive the rails of said ladder-like assembly and constituting the sole means for holding the terminal end portions of the studs in said sockets to maintain the rake-like members in mutual engagement with the studs projecting through a said stack of sheets, said backing strip comprising a generally flat elongate rectangular back portion adapted to extend along the spine edge surface of a said stack of sheets in the device, and spaced opposed flange portions projecting from the opposite long edges of the back portion having opposed inner surfaces and opposed inwardly directed lips along their edges opposite the back portion, the spacing between said lips being adapted to receive the spine of a said stack of sheets therebetween, said lips, flange portions and the portion of said back portion adjacent thereto defining said channels for slidably receiving said ladder-like assembly and conforming in shape to the rails so that when the ladder assembly is engaged with the backing strip the rails substantially fill the channels and are in contact throughout the length of the backing strip; and

means for releasably retaining said ladder-like assembly at a predetermined position longitudinally within said channels, said retaining means comprising two triangular end portions integrally formed on each of said rails, each of which end portions includes an apex forming the terminal end of said rail, a ledge remotely located from said apex and projecting at a right angle from the second surface of said rail with the ledges on both of said rails having an outer tip spaced from the rail second surface a distance far enough so that the distance between adjacent ledge outer tips of said ladder-like assembly exceeds the distance between said inner surfaces of said spaced opposed flange portions so that said ledge outer tips engage both of said backing strip flange portions to flex said rail end portions toward each other when said ladder-like assembly end portions are located within said channel, said ledges each contacting a corresponding terminal end of said opposed flange portions to lock said ladder-like assembly into said predetermined position when said ladder-like assembly is at said predetermined position, said end portions each having a flat cam surface extending from said ledge to said apex and being disposed at an acute included angle relative to said first surface, the cam surfaces on the opposite end portions at each end of said ladder-like assembly being disposed so that upon the manual application of pressure to said cam surface, the rails flex toward each other so that ledges on said adjacent end portions will each move out of engagement with said corresponding terminal end of said backing strip flange portions and into said channel.

4,113,395

BICYCLE STEM AND FORK TUBE ASSEMBLY

Carlton P. Pawsat, and Robert F. Humlong, both of Maysville, Ky., assignors to Wald Manufacturing Company, Inc., Maysville, Ky.

Continuation of Ser. No. 573,746, May 1, 1975. This application Mar. 30, 1977, Ser. No. 782,662
Int. Cl.[2] F16B 2/14
U.S. Cl. 403—22 **16 Claims**

1. A bicycle stem and fork tube assembly comprising:

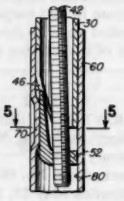
an elongate, hollow, substantially cylindrical fork tube having an interior surface with a predetermined interior diameter;

a stem including an elongate, hollow, substantially cylindrical barrel having an outer surface with a predetermined outer diameter;

a wedge nut having an outer surface and an outer diameter which is slightly less than said fork tube interior diameter;

an abutment defined in the interior surface of the fork tube at a predetermined axial location thereon with the remainder of said surface at said predetermined axial location being essentially smooth, said abutment being defined by an elongate flat surface having a length less than the overall length of said interior surface;

a relieved area comprising an elongate flat surface defined in said wedge nut outer surface at an axial location thereon predetermined to cooperate with said abutment, said wedge nut having an outer diameter just slightly smaller than said fork tube interior diameter and said axial location being selected so that said wedge nut is slidably receivable in said fork tube with said relieved area and said abutment contacting each other, said contacting being effected as soon as said wedge nut is slidably received in said fork tube far enough to align said abutment and relieved area whereby relative rotation between said wedge nut and fork tube is prevented without further adjustments of said wedge nut and fork tube; and



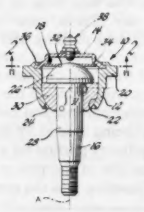
an elongate bolt passing through said stem and threadably engaging said wedge nut for imparting endwise longitudinal motion to said nut relative to said stem and fork tube for maintaining said relieved area and abutment in interlocking engagement with each other.

4,113,396

BALL JOINT WITH SLOTTED SPRING BIASED STUD

Stanley E. Smith, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1977, Ser. No. 829,279
Int. Cl.[2] F16D 1/12
U.S. Cl. 403—138 **1 Claim**



1. An improved preloaded ball joint comprising: a housing having an outward peripheral flange formed about an open end thereof and a reduced opening formed at the opposite end; a ball stud unit consisting of a generally spherical bearing head portion adjacent said open end of said housing and a stud portion disposed outwardly of said reduced opening; a combination preload spring and bearing member having a generally annular form with inner and outer edges disposed in said housing, the inner diameter edge being formed to engage the bearing portion of said ball stud unit at a location opposite said stud portion, the resilient properties of said preload spring and

bearing member biasing the bearing portion of the ball stud unit against said housing; a cover member having an outwardly directed peripheral flange engaged by the outward flange of said housing to close said open housing end, the outer diameter edge of said preload spring and bearing member when assembled in the ball joint directly engaging said cover member to cause the spring inner edge to press against said bearing portion of said ball stud unit; said spring and bearing member having an interrupted inner edge portion formed by radially outwardly extending slots spaced thereabout, thereby shifting the location of the spring's greatest flexure and stress radially outward from the inner diameter edge which sustains the greatest frictional wear by movements of the stud unit.

4,113,397

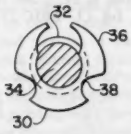
PINLESS RESILIENT COUPLING

Francis H. Snyder, Littlebrook Farm, Newtown, Conn. 06470

Continuation-in-part of Ser. No. 623,513, Oct. 17, 1975. This application Mar. 19, 1976, Ser. No. 668,542

Int. Cl.[2] F16B *21/18*

U.S. Cl. 403—154 **18 Claims**



1. A resilient coupling device operable for engagement with grooved clevis pins and the like, said pins comprising an outer diameter and a core diameter defined by said groove, and comprising in combination:

(A) a resilient member having a base and two extending legs, wherein the inner surfaces of said base and said legs define a partial circular clamping section operable to resiliently engage partially around a core diameter of a grooved clevis pin and the like; wherein,

(B) said legs further define an entry section operable to resiliently engage said core diameter against dislodgement from between said legs, when said diameter is inserted therein, said entry section being defined by first opposing projections, between and proximate the distal ends of said legs thereby to define a gate dimension; and

(C) second opposing projections on said inner surfaces of said legs to define a transition dimension between said entry and clamping section; both of said dimensions being less than said core diameter so as to resiliently maintain said core diameter against dislodgement; wherein

(D) said base and said two extending legs define an annular bearing surface operable for engagement against the annulus defined between the outer and the core diameter of said grooved pin, wherein said base further includes a symmetrically placed single spring dimension below said clamping section, said single spring dimension defining the single minimum wall thickness of said device.

4,113,398

REINFORCED APERTURE IN MOLDED PLASTIC ARTICLE

Edgar R. Jordan, 32260 W. Twelve Mile, Farmington, Mich. 48024

Filed Sep. 3, 1976, Ser. No. 720,107

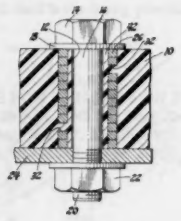
Int. Cl.[2] B25G *3/34*

U.S. Cl. 403—267 **4 Claims**

1. A combination comprising:

a body formed of a molded plastic material, said body having an opening formed therein,

an insert molded in said body, said insert comprising a wire member formed into a coil having a plurality of convolutions each convolution having a diameter greater than the diameter of the body opening and being embedded in the body such that each convolution is disposed about said opening, each convolution being in contact with its neighboring convolution, and



a fastener being disposed in the body opening, the fastener having a head engaged with one end of the coil, and means carried on the opposite end of the fastener for engaging the opposite end of the coil.

4,113,399

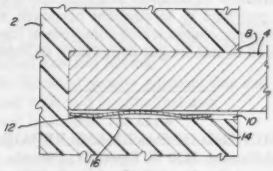
KNOB SPRING

Wray C. Hansen, Sr., 8755 W. 73rd Pl., Arvada, Colo. 80002

Filed Mar. 2, 1977, Ser. No. 773,523

Int. Cl.[2] F16D *1/06*

U.S. Cl. 403—329 **4 Claims**



1. A knob spring for releasably attaching a knob to a shaft end wherein said knob has a recess having a configuration corresponding to that of the shaft end for receiving the shaft end therein and the knob further includes a slot undercut along one edge of the recess and extending beyond the edges of the recess providing guide ways for receiving the ends of the springs, said spring comprising:

a pair of spaced flat parallel strips lying in a plane and having a length substantially equal to the width of the slot so that said strips can be slidingly received in said slot; and

a bowed center member interconnecting said strips, said center member having a width substantially less than the length of said strips to form a leaf spring having a generally H-shaped configuration, said spring being slidable into said slot with the ends of said strips engaging the guide ways formed by said slot and said center bowed portion extending into said recess for engagement by an adjacent surface of the shaft end;

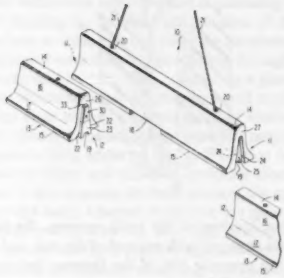
said bowed portion being dimensioned so that upon insertion of said shaft end in said recess the bowed portion will be flattened causing said strips to twist out of the plane so that the edges thereof grippingly engage said slot and the adjacent surface of said shaft end to releasably hold said shaft in said knob so that said knob does not wobble or twist on said shaft end.

4,113,400

IMPACT RESISTANT TONGUE-AND-GROOVE COUPLING FOR HIGHWAY TRAFFIC BARRICADES

Rodney I. Smith, Rte. #1, Midland, Va. 22728

Filed Apr. 18, 1977, Ser. No. 788,691
Int. Cl.² E01F *13/00*
U.S. Cl. 404—6 **17 Claims**



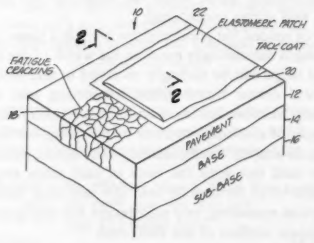
1. In a precast reinforced concrete barricade for use in the construction of a highway lane barrier composed of a plurality of said barricades to be joined by mating tongue-and-groove couplings in endwise alignment, said barricade being elongated and having a generally symmetrical cross-section along its length, the top surface being relatively narrow compared to the width of the base, the upper portions of the side surfaces being nearly vertical, the lower side surfaces being abruptly outwardly flared at an angle to deflect a vehicle wheel away from the barricade, and at least one end wall being provided with an outwardly projecting vertical tongue, the side walls of said tongue being tapered in a downwardly and outwardly transverse direction to facilitate entrance into a complementary groove provided in an adjacent barricade in a vertical direction, the improvement which comprises at least the upper exposed portion of said tongue comprising an impact resistant material.

4,113,401

METHOD OF PAVEMENT REPAIR

Charles H. McDonald, 3130 W. Pierce St., Phoenix, Ariz. 85009

Continuation of Ser. No. 683,381, May 5, 1976, which is a continuation-in-part of Ser. No. 585,836, Jun. 11, 1975, which is a continuation of Ser. No. 376,915, Jul. 5, 1973, which is a continuation-in-part of Ser. No. 589,190, Oct. 21, 1976. This application Apr. 4, 1977, Ser. No. 784,615
Int. Cl.² E01C *7/35*
U.S. Cl. 404—75 **31 Claims**



1. The method of repairing pavement subject to cracking which comprises the steps of:

preparing a hot elastomeric pavement repair material consisting essentially of paving grade asphalt and hydrocarbon rubber by mixing the paving grade asphalt and the hydrocarbon rubber in a ratio of about one to about three parts asphalt to about one part rubber at a temperature within the range of about 300 and about 500° F. to form a jellied composition, the mesh size of the rubber being from about −16 to +200;

treating the surface of the pavement area to be repaired with adhesive means to make the surface tacky and adhesive;

applying a layer of the hot elastomeric material over the pavement to be repaired at a rate of about 0.3 to about 1 gallon of hot elastomeric material per square yard of repaired pavement area;

applying a dressing of aggregate cover having a nomimal size of about one-fourth to about three-eighths inches over the top surface of the hot elastomeric material layer; and

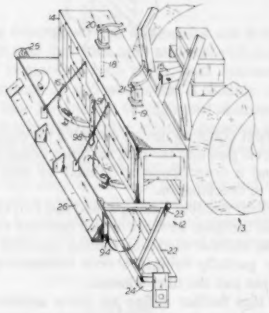
working the aggregate into the hot elastomeric material, the aggregate being applied at a rate of about 25 to about 40 pounds of aggregate per square yard of the hot elastomeric material layer.

4,113,402

PRECISION GRADER

John D. Schillinger, 2417-29th St., Moline, Ill. 61265

Filed Aug. 8, 1977, Ser. No. 822,747
Int. Cl.² E01C *23/12*
U.S. Cl. 404—91 **9 Claims**



1. A machine for preparing precise subgrades comprising:

a plurality of rotary cutters, a screw conveyor, a leveling blade,

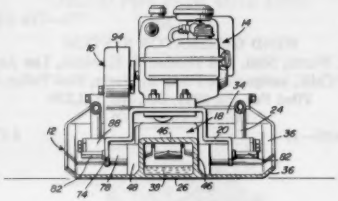
frame means having a coupling on the front thereof to be connected to a tractor hitch for setting the height and tilt of said frame means and for moving said frame means forward slowly, said rotary cutters being rotatably connected to said frame means side by side thereacross and rotatable below said frame means to pulverize soil within a strip of ground over which said frame means is being moved, said screw conveyor being rotatably mounted across said frame means behind said rotary cutters, said leveling blade being connected across said frame means at the rear thereof closely behind said screw conveyor, said rotary cutters being effective to cut a desired level for a subgrade, said leveling blade having a lower edge at a desired distance above said desired level, said screw conveyor being at least as high as an original grade beside said subgrade and having at least one end thereof extending substantially beyond the strip defined by said cutters as said machine is moved forwardly and therefore during operation positioned over said original grade beside said subgrade,

a collar connected to said frame means and fit closely behind and below said screw conveyor at a position in line with an edge of said strip, and said collar having sufficient width to prevent pulverized soil that is being conveyed from said subgrade to said original grade from falling back into said subgrade.

4,113,403
PLATE TYPE COMPACTOR

Christian T. Tertinek, Canandaigua, and Alan J. Stone, Honeoye, both of N.Y., assignors to Stone Construction Equipment Inc., Honeoye, N.Y.

Filed Aug. 31, 1977, Ser. No. 829,581
Int. Cl.[2] E01C *19/38*
U.S. Cl. 404—113 16 Claims

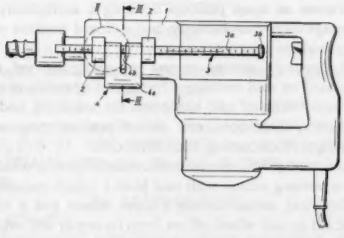


1. A vibratory compactor, comprising a base having a planar bottom portion adapted to be in contact with material to be compacted, a forward end portion, a rear end portion and spaced lateral side portions, housing means connected to the base in spaced relation to said lateral side portions and extending between the forward and rear end portions for confining a body of coolant in direct contact with the planar bottom portion of the base, vibration generating means mounted within the housing means above the planar bottom portion of the base for imparting vibration thereto and to the body of lubricant, a power generator drivingly connected to the vibration generating means for operation thereof, and misting means mounted on the vibration generating means in out of contact relation to the body of lubricant in a static condition for laterally directing the coolant displaced by said vibration from said body of lubricant into lubricating relation to the vibration generating means.

4,113,404
DEPTH STOP FOR A DRILLING MACHINE

Wolfgang Lippacher, Breitbrunn, and Gerhard Teger, Munich, both of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Apr. 28, 1977, Ser. No. 791,950
Claims priority, application Fed. Rep. of Germany, May 3, 1976, 7613952[U]
Int. Cl.[2] B23B *49/00, 45/14*
U.S. Cl. 408—241 S 7 Claims

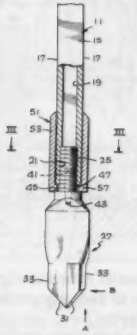


1. On a drilling machine including a casing, a depth stop mounted on said casing, said depth stop comprising an axially displaceable rod, wherein the improvement comprises a clamping lever having a bore therethrough with said rod extending through the bore, said lever being elongated and extending transversely of the axial direction of the bore therethrough, said lever having a clamping surface thereon and being pivotally displaceable about the axis of the bore therethrough for movement of the clamping surface into and out of contact with the casing so that with the clamping surface bearing on said casing, said rod is held against axial displacement, said clamping surface extending circumferentially of the axis of the bore and being arranged eccentrically of the axis, and a pair of bearing lugs secured to said casing and spaced apart in the axial direction of said rod, said lever being pivotally supported on said lugs.

4,113,405
APPARATUS FOR DRILLING OR REAMING

Lester L. Dillinger, 1569 W. 17th St., Long Beach, Calif. 90813

Filed Aug. 8, 1977, Ser. No. 822,790
Int. Cl.[2] B23B *31/44, 27/10*
U.S. Cl. 408—226 7 Claims



1. Apparatus for reaming comprising
a hollow drive shaft adapted to be reciprocatably driven along its longitudinal axis and rotatably driven about its longitudinal axis and having
a female threaded section adjacent one end thereof and co-axial with said longitudinal axis;
a cutterhead including
a cutting edge adjacent one end thereof,
a male threaded portion at the opposite end thereof threadable into said female threaded section of said drive shaft, and
shoulder means intermediate the ends of said cutterhead and oriented substantially perpendicular to the axis thereof, and
cap means removably mounted on said drive shaft adjacent said female threaded section and in frictional engagement with said shoulder means.

4,113,406
COOLING SYSTEM FOR A GAS TURBINE ENGINE

Richard M. Lee, Upper Providence, and Li C. Szema, Nether Providence, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

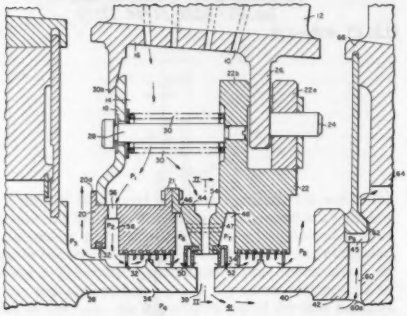
Filed Nov. 17, 1976, Ser. No. 742,739
Int. Cl.[2] F01D *5/08*
U.S. Cl. 415—115 6 Claims

1. In a gas turbine engine having:
a pair of axially adjacent rotor disc means for rotatably supporting rotor blades in the motive gas path, said disc means defining therebetween a relatively narrow axial space leading radially inwardly to a rotor cavity between said adjacent disc means;
stator means including a stationary stator vane disposed in the motive gas path between adjacent rotor blades, sealing means supported at the radially inner end of said vane and bridging said narrow axial space, said sealing means defin-

ing an axial series of seal points along each disc means; and,

coolant delivery means for supplying coolant fluid to both said sealing means and said disc cavity, said delivery means comprising:

a stationary chamber generally adjacent said rotor discs and having inlet means for receiving said coolant fluid at a pressure greater than the pressure of the motive gas at the seal points of the upstream disc of said axially adjacent discs, and having a first outlet means providing fluid flow communication between said chamber and said series of sealing points along said upstream disc,



and a second outlet means in alignment with said narrow axial space to discharge coolant fluid therethrough and into said cavity;

means defining a substantially confined flow path for fluid flow communication from between said seal points of said upstream disc to between the seal points along the adjacent downstream disc; and wherein,

the two outlets of said chamber are sized such that the relative pressure of the fluid is greater at the discharge of said second outlet than between said seal points whereby coolant will not flow into said cavity from between said sealing means.

4,113,407

HIGH PRESSURE INTERNALLY LINED PUMP CASING

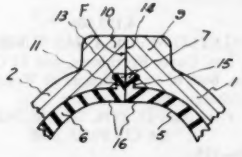
Anthony Grzina, Artarmon, Australia, assignor to Warman International Limited, Artarmon, Australia

Filed Jun. 1, 1976, Ser. No. 691,436

Claims priority, application Australia, Jun. 2, 1975, 1838/75

Int. Cl.[2] F04D *29/08, 29/40;* **F03B** *11/02;* **F01D** *25/24*

U.S. Cl. 415—170 R **3 Claims**



1. A high pressure internally lined pump casing adapted to receive an impeller and split in halves in a plane substantially perpendicular to an axis of rotation of the impeller, said casing halves including flanges with mating faces around the peripheries of said flanges, said mating faces being stepped, two liner halves of elastomeric material having flanges extending into the stepped mating faces, each of said stepped faces having a circumferential undercut groove therein and clamping means at the circumference of said faces for clamping said casing flanges together to displace material from said liner flanges into said grooves.

4,113,408

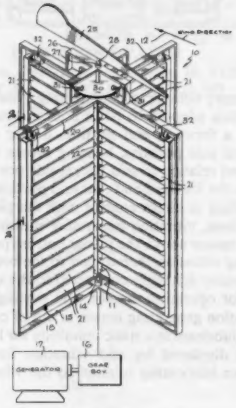
WIND GENERATOR SYSTEM

Frank R. Wurtz, Simi, and Thomas J. Hawkins, Los Angeles, both of Calif., assignors to Frank R. Wurtz, Simi Valley, Calif.

Filed Feb. 25, 1977, Ser. No. 772,270

Int. Cl.[2] F03D *7/06*

U.S. Cl. 416—17 **8 Claims**



1. Windmill generator apparatus for converting natural wind forces into useful energy comprising the combination of:

a stationary frame;

a shaft having a vertical longitudinal axis rotatably carried on said stationary frame;

at least four sets of blades outwardly extending from said rotatable shaft at approximately 90° angles with respect to each other;

each of sets of blades having a plurality of blades pivotally mounted on said shaft so as to rotate therewith and pivot between an open position defining a multiplicity of air passageways therebetween and a closed position occupying said air passageways;

wind direction sensing means moveably carried on and encased by said stationary frame and operably connected to said blades of said blade sets for actuating said blades between their open and closed position responsive to changes of oncoming wind direction;

electro-mechanical means interconnecting said wind direction sensing means with said blades which includes:

an electrical motor having a drive wheel and a rod connected to said wheel off-set from its center and said blades moveably connected to said rod at their ends opposite to the ends pivotally mounted on said shaft;

said wind direction sensing means includes:

a rotatable disk carried on said stationary frame;

a wind vane attached to said disk and responsive to change of wind direction to rotate said disk accordngly; and

electrical detection means responsive to rotation of said disk for selectively operating said blades between their respective open and closed positions.

4,113,409
HOSE PUMP WITH FRICTION DRIVE OF HOLLOW, RESILIENT ROLLER MEANS

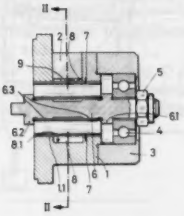
Otto Rossmanith, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung, Munich, Fed. Rep. of Germany

Filed Jan. 31, 1977, Ser. No. 764,022

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1976, 2604002

Int. Cl.² F04B *43/08, 43/12, 45/06*

U.S. Cl. 417—477 **4 Claims**



1. A hose pump, comprising:

a housing having a chamber therein and a pair of axially spaced first rolling surfaces in said chamber;

a hose receiving arcuate groove having an inlet and an outlet, the axial center of said groove being located equidistant from said first rolling surfaces, the depth of said groove being less toward the radial center of said arc than at said inlet and outlet thereof;

a shaft and means supporting said shaft for rotation, said shaft having axially spaced flanges thereon located symmetrical with respect to and axially outside of said first rolling surfaces, said shaft further having a pair of axially spaced second rolling surfaces radially aligned with and spaced radially inwardly from said first rolling surfaces and having a radial dimension less than said flanges; and

a plurality of hollow, rigid cylindrical pinch rollers positioned around said shaft and between said flanges and held by said flanges against axial movement with respect thereto, said pinch rollers having an elastically deformable characteristic and having a diameter greater than said radial spacing between said first and second rolling surfaces whereby said pinch rollers are elastically compressed to an oval shape between said first and second rolling surfaces to thereby enhance a frictional rotary drive from said rotatable shaft to said pinch rollers and are free of engagement with said shaft between said second rolling surfaces.

4,113,410
LIQUID-SEALED TYPE VACUUM PUMP

Sumio Ando, Osaka, Japan, assignor to Otsuka Nutrition Research Institute Inc., Osaka, Japan

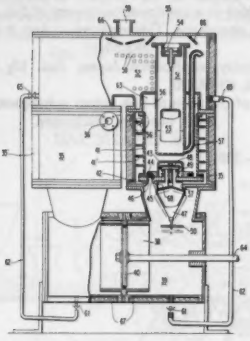
Filed Feb. 25, 1976, Ser. No. 661,077

Claims priority, application Japan, Feb. 25, 1975, 50-26257[U]; Feb. 25, 1975, 50-26258[U]; Aug. 6, 1974, 49-89958; Aug. 26, 1974, 49-97728; Feb. 25, 1975, 50-23618; Aug. 26, 1975, 50-103193

Int. Cl.² F04B *41/00*

U.S. Cl. 417—502 **13 Claims**

1. A liquid-sealed type vacuum pump comprising, at least one liquid containing cylinder having a liquid therein, said liquid containing cylinder including a chamber portion therein adapted to be vacuumized when the pressure of said liquid is reduced, a suction means adapted to be connected to an external device for evacuating said external device, and connected at the other end to said cylinder, a liquid tank connected to said liquid cylinder and pressure means in said liquid tank for alternately increasing and decreasing the pressure of said liquid in said liquid containing cylinder, valve means in said liquid containing cylinder for discharging said liquid when under high pressure and for admitting air from said suction means when said liquid is under lower pressure, means coupled to said suction means and to said cylinder for returning at least part of



said discharged liquid to said cylinder for effectuating a stabilized suction and discharge operation, and fluid cooling means positioned with respect to said suction means and said liquid containing cylinder for cooling and liquidizing the air admitted via said suction means.

4,113,411
EXTRUDER AND SIZER APPARATUS FOR HOLLOW PLASTIC SECTIONS

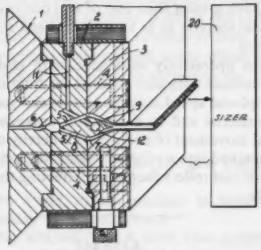
Marco Terragni, Milan, Via Puccini, 5 Italy

Filed Apr. 26, 1976, Ser. No. 680,269

Claims priority, application Italy, May 2, 1975, 22952 A/75

Int. Cl.² B29F *3/03, 3/04*

U.S. Cl. 425—325 **9 Claims**



1. An apparatus, particularly for manufacturing hollow boards of plastic material, comprising an extruder head for extruding a board and a sizer downstream of said extruder head, said sizer comprising a lower chamber and an upper chamber both communicating with a vacuum source, said lower and upper chambers being respectively closed by a generally plate-like lower member and a generally plate-like upper member respectively contacting a lower face and an upper face of said extruded board arranged to pass therebetween, wherein according to the improvement said generally plate-like lower and upper members comprise a plurality of bars arranged side by side and spaced apart such as to define slots therebetween for communicating respectively with said lower chamber and said upper chamber, said bars extending in a direction substantially perpendicular to the direction of advance of said extruded board.

4,113,412
APPARATUS FOR FORMING DOUGH PIECES

Torahiko Hayashi, P.O. Box 50, 2-3 Nozawa-machi Utsunomiya 320, Japan

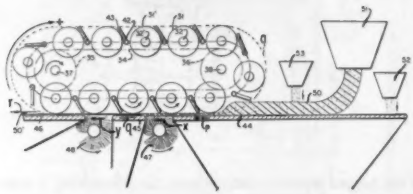
Continuation of Ser. No. 500,701, Aug. 26, 1974, Pat. No. 3,973,895, which is a continuation-in-part of Ser. No. 215,997, Jan. 14, 1972, abandoned. This application Aug. 9, 1976, Ser. No. 712,504

Claims priority, application Japan, Jan. 13, 1971, 46-820; Mar. 28, 1974, 49-35390

The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.

Int. Cl.[2] A21C *3/02*

U.S. Cl. 425—335 2 Claims



1. An apparatus for forming moldable materials such as bakery dough, including:

(a) a conveyor belt adapted to receive said material;

(b) means operatively associated with said conveyor belt for moving said conveyor belt and said material thereon along a predetermined path;

(c) a plurality of rollers movable in unison about an endless roller path having a straight lower portion spaced above and along said conveyor belt, said rollers during their travel along said lower portion of said roller path being aligned transversely across said belt and in contact with said material thereon;

(d) means operatively associated with said rollers for moving said rollers laterally along said lower portion of said roller path in the same direction as said conveyor belt and at a speed greater than that of said conveyor belt and said material thereon so as to compress and stretch said material; and

(e) means operatively associated with said rollers during their contact with said material for rotating said rollers at a peripheral speed independent of the speed of travel of said material and in a direction opposite to that of the lateral movement of said rollers whereby said material can be stretched into a relatively thin sheet without the movement of said rollers therealong effecting the material undesirably.

4,113,413
ROTARY SCRAPER IN A ROTARY DRUM ASSEMBLY

Arthur Jacob Pietrusza, McMurray, and Harry James Kent, Pittsburgh, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Jul. 28, 1976, Ser. No. 709,427

Int. Cl.[2] B01J *2/12*

U.S. Cl. 435—222 13 Claims

1. A rotary drum assembly for forming an agglomerated product from agglomerative materials comprising,

a first drum member having an inlet portion for receiving the agglomerative material and a discharge end portion for discharging the formed agglomerated product,

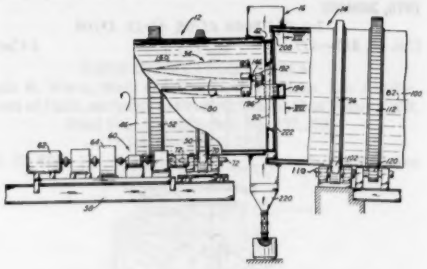
a second drum member having an inlet portion for receiving the agglomerated product from said first drum member and a discharge end portion for discharging the agglomerated product,

means for rotating said first drum member and said second drum member,

said first drum member discharge end portion extending into said inlet portion of said second drum member,

a rotary scraper having a longitudinal axis rotatably positioned in said first drum member,

said rotary scraper having a front end portion and a rear end portion, said rear end portion positioned in said first drum member,



first means for rotatably supporting said front end portion of said rotary scraper,

second means for rotatably supporting said rotary scraper rear end portion within said first drum member, and

means for rotating said rotary scraper.

4,113,414
TAMPER-PROOF SAFETY COVER FOR INJECTION MOLDING MACHINES

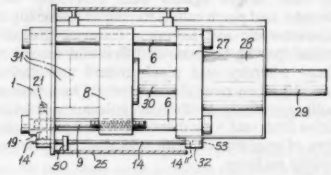
Karl Hehl, Arthur-Hehl-Strasse 32, 7291 Lossburg 1, Fed. Rep. of Germany

Filed May 10, 1976, Ser. No. 684,850

Claims priority, application Fed. Rep. of Germany, May 10, 1975, 2520876; Jun. 28, 1975, 2528907

Int. Cl.[2] B29F *1/00;* F16P *3/02*

U.S. Cl. 425—152 13 Claims



1. In an injection molding machine, a die closing unit comprising in combination:

a stationary die carrier plate mounted on a base frame of the injection molding machine and carrying the stationary half of an injection molding die;

a movable die carrier plate facing the stationary die carrier plate and die half at a longitudinal distance therefrom and carrying the movable half of said die;

means associated with said die carrier plates for guiding the movable die carrier plate in the longitudinal direction, relative to the stationary die carrier plate;

hydraulic drive means connected to the movable die carrier plate, for the creation of opening and closing movements of the movable die carrier plate, said drive means including an electric power supply;

a hydraulic control system and an electrical control system, both being operatively connected to said drive means;

a safety cover enclosing the two die halves and at least the movable die carrier plate in all longitudinal positions against the access to the die;

means guiding the safety cover for a longitudinal opening movement;

safety interlock means operatively connected to the safety cover and to at least one of said control systems, for an automatic shutdown of said drive means, through the interruption and inactivation of said connected control system, or systems, when the safety cover is displaced from its closed position, the safety interlock means including a tamper resistant control member which is nondetachably affixed to the safety cover, and at least one cooperating control system interrupting member which is attached to a stationary part of the machine, said control system interrupting member being inaccessibly enclosed within a housing; and

seal mens associated with said housing to prevent access to said control system interrupting member through said housing, without breaking the seal means.

4,113,415

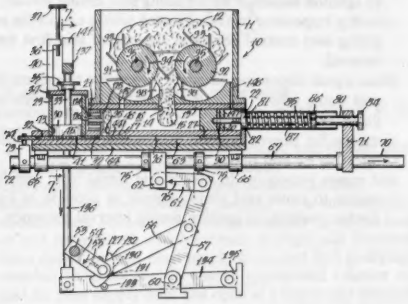
MOLDING APPARATUS

Harry H. Holly, Boca Raton, Fla., assignor to Hollymatic Corporation, Park Forest, Ill.

Continuation-in-part of Ser. No. 737,434, Nov. 1, 1976, Pat. No. 4,043,728, which is a continuation of Ser. No. 619,848, Oct. 6, 1975, abandoned. This application Aug. 18, 1977, Ser. No. 825,651

Int. Cl.[2] A22C *7/00*; B29C *1/00*

U.S. Cl. 425—542 **4 Claims**



1. Apparatus for pressure molding a shaped article from moldable material, comprising: supply means for said material; a pressure chamber communicating with said supply means to receive therefrom; a movable ram means in said pressure chamber for exerting pressure on material therein; a mold having a mold opening; supply passage means from said pressure chamber to said mold opening for supplying said material under pressure in an advancing flow to said mold opening; vent means for venting air from in front of said advancing flow upon movement of the ram means toward said supply passage means during said supplying of said material; normally open valve means in said vent means permitting said venting; and means operated by said advancing material for closing said valve means after said air is vented, said vent means and valve means being located in their entirety in said pressure chamber and away from said mold opening during said supplying of said material.

4,113,416

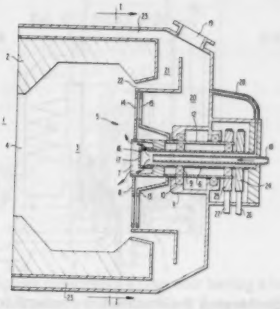
ROTARY BURNER

Rikio Kataoka; Shigeru Yano; Yoshito Kumamoto; Haruo Watanabe; Hisao Kaya, all of Kure; Kiyoshi Aoki, Chiba, and Masanao Kitamura, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Feb. 24, 1977, Ser. No. 771,665

Int. Cl.[2] F23D *11/04*

U.S. Cl. 431—1 **13 Claims**



1. A rotary burner comprizing

(a) a front rotary disk formed with a plurality of equiangularly spaced radially extended slits,

(b) a rear rotary disk formed with a plurality of equiangularly spaced radially extended slits whose configurations and pitch are same with those of the slits of said front rotary disks, said front and rear rotary disks being coaxially arrayed and spaced apart from each other by a predetermined distance,

(c) a combustion air supply passage for supplying the combustion air to pass through said slits of said rear and front rotary disks,

(d) a fuel supply means for supply the liquid fuel to the center of either of said front or rear rotary disk, and

(e) means whereby upon rotation of either one of said front and rear rotary disks or upon rotation of both of them in opposite directions, uniform and stable ultrasonic waves may be generated for uniformly atomizing the liquid fuel.

4,113,417

COMBUSTION OF HOT GASES OF LOW CALORIFIC POWER

Jean Deruelle, St. Avold, France, assignor to Stein Industrie, Velizy-Villacoublay (Yvelines), France

Division of Ser. No. 628,768, Nov. 4, 1975. This application Jan. 6, 1977, Ser. No. 760,140

Claims priority, application France, Nov. 6, 1974, 74 36828

Int. Cl.[2] F23D *13/20*

U.S. Cl. 431—5 **8 Claims**

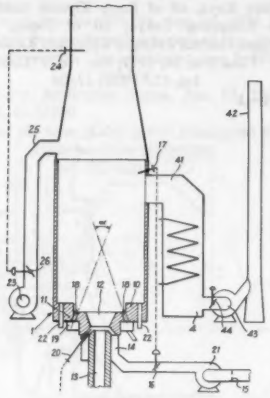
1. A process for the complete combustion of hot gases of low calorific power, such as reducing smoke of rich gases and by-products of the carbonisation of coal, which gases are available at a pressure close to atmospheric pressure, said process using at least one burner in a combustion chamber having means for introducing primary air and means for introducing secondary air and comprising the steps of:

(a) introducing the gases into the combustion chamber at the available pressure close to atmospheric pressure and at a temperature of between 600° and 900° C,

(b) introducing primary air at burner level in an amount limited to a maximum of 80% of the stoichiometric proportion,

(c) supplying secondary air near the base of the flame in an

excess relation to the stoichiometric amount such that the flame temperature is between 1,000° and 1,300° C, and



(d) discharging the combustion products from the combustion chamber by means of a chimney.

4,113,418

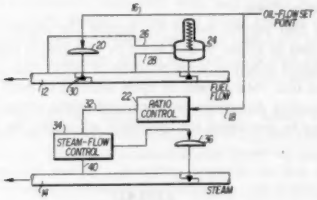
ROTARY BURNER CONTROL

Donald W. Larcen, 2417 Grenoble Rd., Richmond, Va. 23229

Continuation-in-part of Ser. No. 664,214, Mar. 5, 1976, Pat. No. 4,035,133. This application Jun. 8, 1977, Ser. No. 804,689

Int. Cl.² F23M *1/02*

U.S. Cl. 431—12 **14 Claims**



1. A method of operating a rotary burner of the type in which quantities of fuel and steam are controlled, respectively by a diaphragm motor valve and a steam-flow control mechanism to deliver fuel and steam into an air stream through a rotating member, said method comprising the steps of:

determining the amount of fuel flow that is required through said burner to produce various values of heat release;

adjusting a ratio-control device to provide an output signal level to said steam-flow control mechanism corresponding to a desired steam flow for each given fuel flow in a series of fuel flows;

setting said diaphragm motor valve to adjust flow area therein for providing a flow of fuel corresponding to a desired heat release value;

monitoring the differential pressure across said flow area and adjusting said fuel flow to maintain a differential pressure corresponding to the desired fuel flow through said flow area; and,

regulating said steam flow in accordance with the previously adjusted output signal level from said ratio-control device corresponding to said desired heat release value.

4,113,419

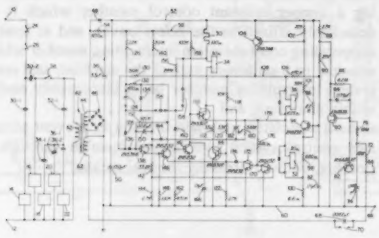
BURNER CONTROL APPARATUS

Phillip J. Cade, Winchester, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed Apr. 12, 1976, Ser. No. 675,778

Int. Cl.² F23N *5/00* H01N *7/00*

U.S. Cl. 431—78 **37 Claims**



1. Burner control apparatus for use with a fuel burner installation having an operating control to produce a request for burner operation, a flame sensor to produce a signal when flame is present in said fuel burner installation, and means responsive to said burner control apparatus for controlling fuel flow, said burner control apparatus comprising

a control device for actuating said fuel control means,

a timing circuit for providing two successive timing intervals of precise duration, a pre-ignition timing interval and an ignition timing interval, said timing circuit having a common capacitor, one of said timing intervals being a function of the charging of said common capacitor and the other timing interval being a function of the discharging of said common capacitor,

means responsive to a request for burner operation to initiate an ignition sequence by actuating said timing circuit;

circuitry responsive to said actuated timing circuit for energizing said control device at the end of said first timing interval,

flame signal responsive circuitry responsive to a signal from said flame sensor to maintain said control device energized, and

circuitry for preventing the production of further timing intervals by said timing circuit,

and means responsive to loss of said signal from said flame sensor to cause said timing circuit to provide at least a further preignition ignition timing interval sequence.

4,113,420

FLASHLAMP ASSEMBLY WITH TAPERED HOUSING

Robert P. Bonazoli, Hamilton, and William H. Morgan, Jr., Assonet, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jul. 5, 1977, Ser. No. 812,916

Int. Cl.² F21K *5/02*

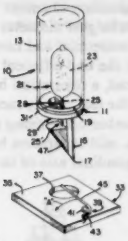
U.S. Cl. 431—93 **10 Claims**

1. A flashlamp assembly comprising:

an elongated housing including a light-transmitting first end portion defining a chamber therein, a second end portion adjacent said first end portion, said second end portion including a tapered end portion and a recess between said tapered end portion and said first end portion; and

a percussively-ignitable flashlamp having a light-transmitting envelope and a primer tube projecting therefrom, said

envelope positioned within said chamber within said first end portion and said primer tube securedly positioned



within said second end portion such that a portion of said primer tube is located within said recess.

4,113,421

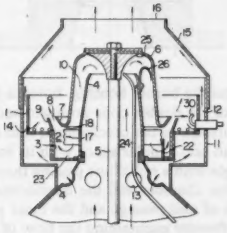
GASIFIED LIQUID FUEL BURNER

Kingo Miyahara, Tokyo, Japan, assignor to Dowa Co., Ltd., Tokyo, Japan

Claims priority, application Japan, May 29, 1976, 51-69368[U]; Dec. 14, 1976, 51-167311[U]

Int. Cl.² F23D *11/04*

U.S. Cl. 431—122 **9 Claims**



1. A gasified liquid fuel burner comprising:

a combustion chamber of a cylindrical shape closed at its bottom;

an air blast supply duct open at a forward end thereof and inserted into said combustion chamber;

a rotary shaft inserted into said combustion chamber;

a hollow rotary fuel gasifying member of a substantially conical shape connected at a closed end thereof to one end of said rotary shaft which extends through said forward open end of said air blast supply duct, said fuel gasifying member being located in spaced superposed relation to said air blast supply duct and open at a lower end thereof so that an obliquely outwardly turned portion is formed integrally with the open end of said fuel gasifying member;

a liquid fuel supply line having an open end positioned adjacent the closed end of the fuel gasifying member to supply a liquid fuel to an inner surface of the fuel gasifying member;

a gas chamber open at one end thereof and located at the bottom of said combustion chamber, said open end of said gas chamber having said obliquely outwardly turned portion of the fuel gasifying member slightly inserted therein so as to maintain communication between the interior of the fuel gasifying member and the gas chamber, and said gas chamber and the obliquely outwardly turned portion of the fuel gasifying member defining therebetween an annular gasified fuel-air mixture ejection opening; and

a gasified fuel-air mixing member of a cylindrical shape located in said gas chamber in such a manner that there is a small gap between the gasified fuel-air mixing member and the gasifying member.

4,113,422

SMOKER'S LIGHTER

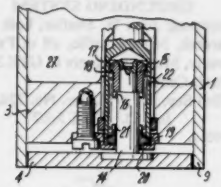
Andre Guenin, Petit-Lancy, Switzerland, assignor to La Nationale S.A., Geneva, Switzerland

Filed Jul. 13, 1976, Ser. No. 704,794

Claims priority, application Switzerland, Jul. 21, 1975, 9498/75

Int. Cl.² F23Q *2/38*

U.S. Cl. 431—124 **4 Claims**



1. A smoker's lighter comprising a reservoir having a bottom into which two orifices open, one for filing the reservoir and the other for the adjustment or replacement of an element of the lighter, a cover overlying said bottom, said cover carrying a pivot having an axis substantially perpendicular to said bottom and about which said cover can be rotated to uncover said two orifices while remaining parallel to itself, said axis of said pivot disposed outside a line joining the center point of said two orifices, said pivot disposed off-center in relation to the periphery of the cover so that in addition to a position covering the two orifices the cover can be brought into two other positions whereby in each one of said two other positions opposite ends of said cover respectively uncover and cover alternate ones of said two orifices.

4,113,423

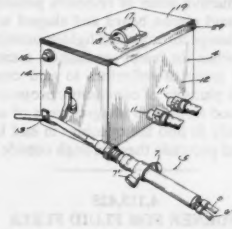
TORCH IGNITER

H. Karl Steiner, 3224 S. 92nd St., Milwaukee, Wis. 53227

Filed Jan. 24, 1977, Ser. No. 761,667

Int. Cl.² F23Q *3/00*

U.S. Cl. 431—128 **13 Claims**



1. An igniter for hand-held gas torches of the type having a nozzle from which combustible gas issues, comprising:

A. a box-like enclosure, one wall of which has an access opening;

B. a pair of electrodes across which a spark occurs upon connection of said electrodes with an appropriate source of e.m.f;

C. means mounting said electrodes in the enclosure at a location near said one wall of the enclosure but spaced from the access opening therein; and

D. gas flow directing means in the form of a metal cup mounted on said one wall and located in the access open-

ing therein, with the mouth of the cup straddling an edge portion of the access opening and facing towards the pair of electrodes, so that the cup coacts with said one wall to define a passage leading from an entrance at the outer face of said edge portion to an exit at the inner face of said edge portion facing towards the pair of electrodes,

whereby a jet of combustible gas issuing from the torch and projected into the entrance of said passage impinges upon the bottom of the cup and is thereby reversed in direction to flow out of the exit towards the electrodes.

4,113,424

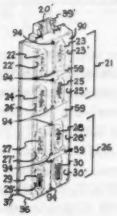
MULTILAMP PHOTOFLASH UNIT WITH STATIC GROUNDING SYSTEM

Donald E. Armstrong; John W. Shaffer, both of Williamsport; Paul M. Marecek, Montoursville, all of Pa., and Emery G. Audesse, Beverly, Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sep. 20, 1976, Ser. No. 724,792

Int. Cl.² F21K 5/02

U.S. Cl. 431—95 A **6 Claims**



1. A photoflash unit comprising a plurality of electrically ignitable flashlamps each having a pair of lead-in wires, a circuit board containing circuitry for selectively igniting said flashlamps, means electrically connecting the lead-in wires of said flashlamps to said circuitry, said circuitry including a common circuit conductor connected electrically to one lead-in wire of each of said flashlamps, a housing of insulating material enclosing said flashlamps and circuit board, connector means extending from said housing and having external terminals connected to said enclosed circuitry, said housing having at least one light-transmitting side wall adjacent to said plurality of flashlamps and having a plurality of openings therein, an electrically conductive array of refectors positioned between said lamps and said circuit board and shaped to reflect light from respective lamps through said light-transmitting side wall of said housing when the lamps are flashed, means electrically connecting said array of reflectors to said common circuit conductor, and a plurality of conductive projections from said reflector array and formed as integral parts of said array and which respectively fit into the openings in said light-transmitting side wall and protrude therethrough outside said housing.

4,113,425

BURNER FOR FLUID FUELS

Robert von Linde; Joachim von Linde, both of Graefelfing, and German Kurz, Karlsfeld, all of Germany, assignors to Caloric Gesellschaft Fuer Apparatebau m.b.H, Germany

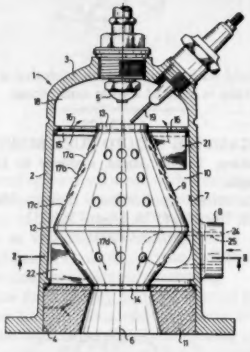
Filed May 27, 1976, Ser. No. 690,617

Claims priority, application Fed. Rep. of Germany, May 30, 1975, 2524036

Int. Cl.² F23D 15/02

U.S. Cl. 431—352 **10 Claims**

1. A burner for fluid fuels comprising an essentially cylindrical burner housing having an open end and a closed end, the open end being connectible to an exhaust pipe, a fuel supply means in the closed end and arranged in the longitudinal center axis of the housing, a combustion air supply passage in the peripheral wall of the housing, a tubular combustion chamber arranged coaxially within the housing, an annular space between said combustion chamber and the inner peripheral wall of the housing, said space being closed towards the open end of the housing, said combustion chamber having the shape of a double cone having its largest diameter between its ends, said double cone being asymmetrical and having said largest diameter farther away from the end adjacent the fuel supply means than from the other end, a separation between the end of the double cone adjacent the fuel supply means and said peripheral wall to form a prechamber comprising said fuel supply means and an ignition means, said separation being substantially perpendicular to the longitudinal axis of the combustion chamber



and separate from the burner housing, holes in said separation and in the wall of the double cone arranged and sized to form a rich fuel-air mixture in the prechamber, said air supply passage opening into said annular space with its longitudinal axis including an angle with a radial line passing through the center of the combustion chamber and the intersection between the longitudinal axis of said passage and the inner peripheral wall of the housing, thereby maintaining the flow of air in a helical path along the outer surface of the combustion chamber, a part of this air entering the holes of the combustion chamber and assuring a rotational path of travel forming an air veil along the inner surface of said combustion chamber.

4,113,426

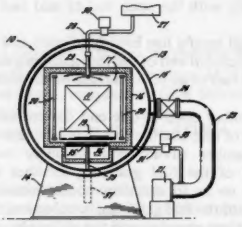
METHOD FOR CIRCULATING A HEAT TREATING GAS

Ronald D. Rogers, Rockford, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Division of Ser. No. 547,107, Feb. 5, 1975, Pat. No. 4,030,712. This application Mar. 25, 1977, Ser. No. 781,113

Int. Cl.² F27D 7/00

U.S. Cl. 432—25 **7 Claims**



1. A method of heat treating a work load comprising the steps of, admitting a sustantially continuous flow of processing gas into an inlet of a heated chamber containing the work load, exhausting a substantially continuous flow of gas from an

outlet of said chamber, and imparting a repeated back and forth pulsating motion to the gas in the chamber as the gas flows through said chamber and while gas continues to flow into said inlet thereby to circulate the gas past the work load with a reciprocating action while substantially continuously replenishing the gas in the chamber, said pulsating motion being imparted to the gas by repeatedly increasing and decreasing the effective volume of the chamber.

4,113,427

PROCESS FOR DYEING CELLULOSIC TEXTILES WITH VAT AND SULFUR DYES

Andrew Fono, Montclair, N.J., and Ray F. Patton, Burlington, N.C., assignors to Royce Chemical Company, East Rutherford, N.J.

Filed Apr. 26, 1976, Ser. No. 680,198
Int. Cl.[2] C09B *9/00, 49/00;* D06P *1/22*
U.S. Cl. 8—34 16 Claims

1. A reducing agent composition for dyeing a cellulosic textile with a vat and sulfur dye which comprises about 85–97.5% by weight of sodium dithionite and about 2.5–15% by weight of sodium hydroxymethanesulfinate.

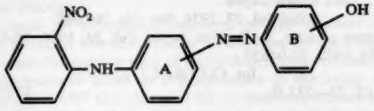
4,113,428

PROCESS FOR DYEING FIBRE MATERIALS

Herbert Hugl; Karl Heinz Schündehütte, both of Leverkusen; Kersten Trautner, Cologne, and Gerhard Wolfrum, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 6, 1977, Ser. No. 813,311
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1976, 2630991
Int. Cl.[2] C09B *27/00, 45/48;* C07C *107/06*
U.S. Cl. 8—41 R 10 Claims

1. A process for dyeing a hydrophobic fiber material by applying a dyestuff from an aqueous or organic liquor in which said dyestuff has the formula

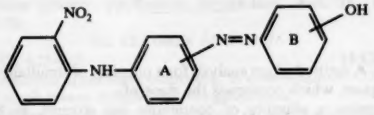


wherein

the aromatic rings A and B are unsubstituted or are substituted by halogen, alkyl, alkoxy cycloalkyl or aryl;

the azo group is in the meta-position or para-position relative to the amino group of the diphenylamine; and the phenolic hydroxyl group is in the ortho-position or para-position relative to the azo group.

6. A hydrophobic fiber material dyed with a dyestuff having the formula



wherein

the aromatic rings A and B are unsubstituted or are substituted by halogen, alkyl, alkoxy, cycloalkyl or aryl;

the azo group is in the meta-position or para-position relative to the amino group of the diphenylamine; and the phenolic hydroxyl group is in the ortho-position or para-position relative to the azo group.

4,113,429

PREPARATION OF A DISPERSE DYESTUFF CONTAINING A PHOSPHORIC ACID ESTER, HAVING IMPROVED SAFETY PROPERTIES AND HIGHER DYESTUFF YIELD WHEN DYED ON SYNTHETIC MATERIALS

Hubert Kruse, Kelkheim, Taunus, and Konrad Opitz, Liederbach, Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 26, 1976, Ser. No. 690,023
Claims priority, application Fed. Rep. of Germany, May 28, 1975, 2523659
Int. Cl.[2] D06P *1/16, 1/18, 1/20, 3/36*
U.S. Cl. 8—90 1 Claim

1. A dyestuff preparation consisting of

(1) 5 to 60 per cent by weight of a disperse dyestuff which is insoluble or sparingly soluble in water and which does not contain a water-solubilizing group,

(2) as a dispersing agent, 5 to 90 per cent by weight of a condensation product of a naphthalene sulfonic acid with formaldehyde, a condensation product of a naphtholsulfonic acid with formaldehyde, a condensation product of a phenol with formaldehyde, or a lignin sulfonic acid,

(3) as a wetting agent, 0 to 90 per cent by weight of an alkylated naphthalene sulfonic acid, a fatty acid, a resinic acid, a sulfated primary aliphatic alcohol of 10 to 18 carbon atoms, a sulfated unsaturated fatty acid, a fatty acid ether, a fatty acid amide, a sulfated alkylene oxide adduct, a sulfated partially esterified polyvalent alcohol, an alkylsulfonate, an alkylarylsulfonate, an alkylnaphthalene sulfonate, a sulfonate of a polycarboxylic acid ester, a sulfonate of a polycarboxylic acid amide or a condensation product of a fatty acid with an aminoalkylsulfonate,

(4) as a diluent or grinding auxiliary, 0 to 60 per cent by weight of a polyvinylsulfonate, gallic acid, a protective colloid, starch, dextrin, casein, an alginate, gelatin, carboxymethyl cellulose, polyvinyl pyrrolidone or polyacrylate, and

(5) 0.5 to 30 per cent by weight of a phosphoric ester of the formula

$$HO-\overset{\overset{O}{\|}}{P}[O(C_nH_{2n}O)_mR]_2 \quad \text{or} \quad O=P[O(C_nH_{2n}O)_mR]_3$$

wherein n is 2 or 3, m is 0 to 10 and R is an alkyl radical of 8–20 carbon atoms.

4,113,430

METHOD FOR MODIFYING FIBERS OF A FABRIC AND THE PRODUCTS SO PRODUCED

Wolfgang K. F. Otto, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 729,260, Oct. 4, 1976. This application May 23, 1977, Ser. No. 799,623
Int. Cl.[2] D06M *9/00, 1/02*
U.S. Cl. 8—115.5 13 Claims

1. A method for modifying fibers in the stratum of fibers at one surface of a fabric comprising:

(a) applying an effective amount of a heat activated fiber modifying agent to a fabric to substantially cover a surface of the fibers of the fabric;

(b) heating the surface of the fabric containing the stratum of fibers to be modified to a temperature of from about 150° F. to about 425° F. for a period of time effective to initiate a chemical reaction between the fibers of the fabric within the stratum of fibers at the surface of the fabric being heated and said heat activated fiber modifying agent and thereby modify such fibers within the stratum;

(c) simultaneously maintaining a temperature differential between the heated surface of the fabric and the opposite surface of the fabric of at least about 50° F. so as to control

the depth of penetration of the chemical reaction and limit the fiber modification of the fibers to substantially the stratum of fibers at the surface of the fabric being heated;
(d) quenching the chemical reaction; and
(e) recovering a resulting product.

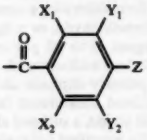
4,113,431

METHOD FOR DYEING CELLULOSE FIBERS BY DISPERSE DYES

Yasuhiko Terada, Kashihara; Jun Yasuda, Osaka, and Masao Kuriyama, Itami, all of Japan, assignors to Shikibo Limited, Osaka, Japan

Filed Feb. 26, 1976, Ser. No. 661,825
Claims priority, application Japan, Feb. 27, 1975, 50-25440
Int. Cl.[2] D06M *13/00*
U.S. Cl. 8—120 **10 Claims**

1. A method for dyeing cellulose fiber with improved color fastness using disperse dyes which comprises the steps of: reacting cellulose fiber with an aromatic acylating agent having an acyl group represented by a general formula



wherein X_1, X_2, Y_1, Y_2 and Z are members selected from the group consisting of hydrogen, halogen, alkyl, nitro, methoxy, phenylazo, and amino groups; controlling the reaction of cellulose fiber with the acylating agent by adjusting the concentration of reactants, temperature and reaction time whereby the acyl group is introduced into the cellulose fiber to form a cellulose fiber derivative having a substitution degree of between 0.10 and 0.50; recovering the cellulose fiber derivative; and contacting the cellulose fiber derivative with disperse dyes.

4,113,432

METHOD FOR MODIFYING FIBERS OF A FABRIC AND THE PRODUCTS SO PRODUCED

Wolfgang K. F. Otto, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed May 23, 1977, Ser. No. 799,620
Int. Cl.[2] D06M *1/02*
U.S. Cl. 8—125 **14 Claims**

1. A method for modifying fibers in the stratum of fibers at one surface of a fabric comprising:
(a) applying an effective amount of a heat activated fiber modifying agent to a fabric to substantially cover the fibers in the stratum of fibers of one or both surfaces of the fabric;
(b) applying an effective amount of a deactivating agent to a second surface of the fabric to substantially cover the fibers of said fabric which are to remain substantially unmodified within said fabric, said second surface being opposite the surface containing the stratum of fibers of said fabric to be modified with said heat activated fiber modifying agent;
(c) heating the surface of said fabric containing the stratum of fibers to be modified and covered with said heat activated fiber modifying agent at a temperature of from about 150° F. to about 425° F. for a period of time effective to allow modification of the fibers in the stratum of fibers to be modified by a chemical reaction between the fibers coated with the heat activated fiber modifying agent in such stratum of fibers and such agent;
(d) simultaneously maintaining a temperature differential of at least about 50° F. between the heated portion of the fabric containing the stratum of fibers to be modified and covered with said heat activated fiber modifying agent and second surface of said fabric so that the depth of penetration of the chemical reaction and fiber modification is controlled to substantially the stratum of fibers to be modified;
(e) quenching the chemical reaction; and
(f) recovering a resulting product.

4,113,433

RADIOIMMUNOASSAY OF HORMONES AND METABOLITES IN BLOOD SERUM AND PLASMA

Gyaneshwar Prasad Khare, 311 S. Heatherstone St., Orange, Calif. 92669

Filed Dec. 15, 1975, Ser. No. 640,841
Int. Cl.[2] G01R *33/16*
U.S. Cl. 23—230.6 **10 Claims**

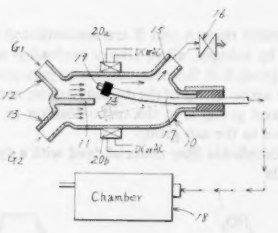
1. A process for assaying hormones or metabolities comprising the following:
(a) contacting antibody specific to said hormones or said metabolites coated pearl with a mixture containing reaction buffer, a sample being assayed, and a known amount of radioactive antigen, said radioactive antigen being specific to said antibody, for a period sufficient for antigen-antibody complex formation at 20° C to about 45° C,
(b) removing the mixture,
(c) washing the antigen-antibody complex,
(d) detecting the amount of radiation emanating from the pearl bound antigen-antibody complex,
(e) and relating the measured amount of radioactivity to the presence of said hormones or said metabolites in said sample.

4,113,434

METHOD AND APPARATUS FOR COLLECTIVELY SAMPLING A PLURALITY OF GASEOUS PHASES IN DESIRED PROPORTIONS FOR GAS ANALYSIS OR OTHER PURPOSES

Shinzo Tanaka, Osaka; Shinichi Tsubamoto, Kyoto; Koichi Yamashita; Tadashi Eguchi, both of Nara, and Kashirou Inoue, Osaka, all of Japan, assignors to Yanagimoto Seisakusho Co., Ltd., Kyoto, Japan

Filed Jul. 27, 1976, Ser. No. 709,088
Claims priority, application Japan, Jul. 30, 1975, 50-93741; Jul. 31, 1975, 50-94620
Int. Cl.[2] G01N *1/22*
U.S. Cl. 23—232 R **37 Claims**



18. A method of gas analysis for a plurality of simultaneously fed gases, which comprises the steps of:
forming a plurality of continuous gas streams, each gas stream formed by a different gas;
introducing all of said gas streams into a common definite space so that mixing of said gas streams is substantially prevented, at least near the point of introduction into said space;
sequentially sampling predetermined stream lengths of gas from said gas streams through a single sampling conduit positioned within the defined space so that an essentially

continuous flow is provided in the conduit, comprising a series of stream lengths of the different gases; and

conducting the continuous flow of gas stream lengths to a gas detector which is sensitive to a particular substance, detector adapted to generate a series of signals corresponding to the concentrations of said particular substance in each gas.

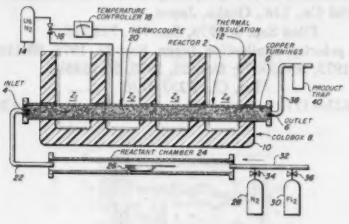
4,113,435
CRYOGENICALLY CONTROLLED DIRECT FLUORINATION APPARATUS

Richard J. Lagow, Manchester; James L. Adcock, and Norma J. Maraschin, both of Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 16, 1973, Ser. No. 379,876

Int. Cl.² B01J *1/00, 8/02;* **C07C** *53/16, 121/00*

U.S. Cl. 422—191 **14 Claims**



1. A direct fluorination apparatus comprising, in combination:

a. a reactor having a reactant inlet at one end of said reactor and a product outlet at the opposite end of said reactor;

b. means for separating said reactor into a plurality of independently controllable temperature zones positioned consecutively within said reactor between the reactant inlet and the product outlet;

c. means for introducing a source of first reactant at said reactant inlet, said first reactant being a source of elemental fluorine;

d. means for introducing a second gaseous reactant to be fluorinated into said reactor at said reactant inlet; and,

e. means for cooling each of said independently controllable temperature zones to a temperature in the range from about −190° C to about +20° C, said temperature being sufficiently low in each zone to cause partially fluorinated second reactant to condense therein as it passes therethrough whereby further fluorination of said second reactant takes place.

4,113,436
AUTOMATIC ANALYSIS APPARATUS

Roger Daniel Werder, Mohlin; Linus Meier, Effretikon, and Karl Lang, Uerikon, all of Switzerland, assignors to Mettler Instrumente AG, Greifensee, Switzerland

Filed Feb. 10, 1975, Ser. No. 551,517

Claims priority, application Switzerland, Feb. 15, 1974, 2119/74

Int. Cl.² G01N *1/14, 33/16*

U.S. Cl. 422—65 **14 Claims**

1. Analysis apparatus comprising, in combination:

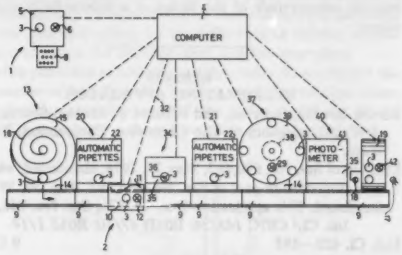
(a) track means defining an elongated path;

(b) carrier means adapted to move on said track means in said path while carrying a container;

(c) a plurality of station means spaced along said path, each station means including a container support adjacent said path;

(d) drive means for moving said carrier means on said track means; p1 (e) transfer means adjacent said path for transferring a container between said carrier means and the container support of each of said station means when the carrier means is aligned with the station means transversely of said path,

(1) said transfer means including means for moving a container from said carrier means to the container support of a predetermined station means, and for simultaneously moving another container from the container support of said predetermined station means to said carrier means,



(2) one of said station means including dosing means for introducing a predetermined amount of liquid into a container supported on the container support of said one station means,

(3) another station means including analyzing means for analyzing the contents of a container transferred to the container support of said other station means; and

(f) control means for operating said drive means, said transfer means, said dosing means, and said analyzing means in timed sequence.

4,113,437
LIQUID STORAGE DEVICE

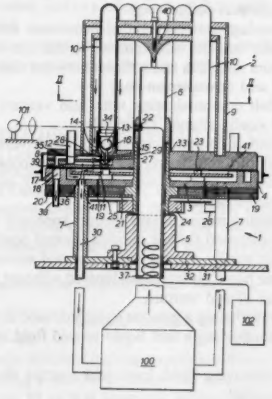
Ian David Duff, New York, N.Y.; John Hamilton Kennedy, and Roger Abraham Bunce, both of Birmingham, England, assignors to The Secretary of State for Social Services, London, England

Filed Aug. 6, 1976, Ser. No. 712,164

Claims priority, application United Kingdom, Aug. 13, 1975, 33797/75

Int. Cl.² B01L *3/00;* **G01N** *1/10*

U.S. Cl. 422—63 **11 Claims**



1. Liquid storage apparatus comprising a base part, a heat jacket on said base part, a plurality of liquid storage containers carried by said jacket and disposed with at least their lower

parts within said jacket, respective cups for the liquid storage containers, these cups being carried by said base part alongside said jacket and having upwardly facing openings through which access may be gained to liquid in the cups, passage means connecting the containers to the cups to replenish liquid withdrawn from any cup with fresh liquid from the respective liquid storage container, means, responsive to changes in liquid levels in the cups, to maintain the liquid in each cup at a substantially constant level, and means arranged to maintain the internal temperature of the jacket at a substantially constant value.

4,113,438

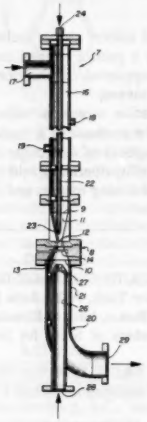
SULFONATING APPARATUS

Burton Brooks, Bellevue, and Richard J. Brooks, Seattle, both of Wash., assignors to The Chemithon Corporation, Seattle, Wash.

Division of Ser. No. 690,652, May 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 393,192, Aug. 30, 1973, abandoned. This application Dec. 1, 1976, Ser. No. 746,242

Int. Cl.[2] C07C *143/24;* B01D *47/10;* B01J *1/14*

U.S. Cl. 422—193 **9 Claims**



1. An apparatus for reacting a gaseous agent with a first liquid, said apparatus comprising:

a venturi having upstream and downstream ends, an approach zone between said ends with sides converging in a downstream direction and a throat between said approach zone and said downstream end;

a first conduit communicating with said venturi approach zone and axially aligned therewith;

a second conduit communicating with the downstream end of said venturi and having a vertically disposed conduit portion axially aligned with said venturi immediately downstream thereof;

fluid introducing means in said venturi approach zone;

a vertically disposed further conduit located concentrically within said axially aligned portion of said second conduit and having liquid outlet means located adjacent the downstream end of said venturi;

means for introducing a gaseous agent into said first conduit;

means for conducting a first liquid to said fluid introducing means;

means for removing fluid from said venturi through said second conduit;

means for introducing a second liquid into said further conduit;

means, including said liquid outlet means on said further conduit, for providing said second liquid as a continuous phase adjacent the downstream end of the venturi, with said second liquid in the form of a moving stream;

the inside surface of said vertically disposed portion of the second conduit and the outside surface of said further conduit comprising means defining a vertically disposed, axially elongated annulus having a pair of facing surfaces;

means, including said liquid outlet means on said further conduit, for flowing a film of said second liquid downwardly along said outside surface of said further conduit;

and means for flowing a film of said second liquid downwardly along said inside surface of said vertically disposed portion of the second conduit.

4,113,439

COOKING APPARATUS EMPLOYING A PURGING DEVICE

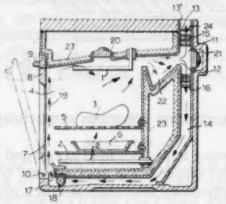
Toshio Ookubo, Nara; Atsushi Nishino, Neyagawa, and Tadashi Suzuki, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 8, 1976, Ser. No. 721,545

Claims priority, application Japan, Sep. 11, 1975, 50-110788; Dec. 26, 1975, 50-159379; Dec. 26, 1975, 50-159382

Int. Cl.[2] F23J *5/10*

U.S. Cl. 422—177 **2 Claims**



1. A cooking apparatus having a cooking chamber for cooking a food and a purging device for receiving the exhaust gas from the cooking chamber and purging the gas, said purging device having a housing with an exhaust inlet for receiving the exhaust gas from the cooking chamber and admitting it into the housing and an exhaust outlet for exhausting the gas into the outside of the apparatus, and at least one catalyzer arranged transversely of the housing and having passages therein through which the gas is passed for purifying it, said catalyzer having a specific surface area of 10 m^2/g to 100 m^2/g, and being composed of manganese dioxide as the main component and aluminic acid lime as a binder, and means for maintaining the temperature of the gas at the outlet of said housing higher than 130° C and wherein the inside condition of the apparatus is controlled so that the space velocity is 1,000 – 50,000 hr^{-1}.

4,113,440

APPARATUS FOR PRODUCING POLYMERS HAVING A WIDE MOLECULAR WEIGHT DISTRIBUTION

Dirk Klaasen, Geleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Jul. 27, 1976, Ser. No. 709,080

Claims priority, application Netherlands, Aug. 5, 1975, 7509293

Int. Cl.[2] B01J *8/08*

U.S. Cl. 422—132 **4 Claims**

1. An installation for preparing polymers of wide molecular weight distribution comprising

two reactors A and B, each of said reactors being provided with an inlet means and an outlet means;

a first conduit means connecting said inlet means of reactor A with the outlet means of reactor B; and

a second conduit means connecting said inlet means of reactor B with outlet means of reactor A, thereby forming a

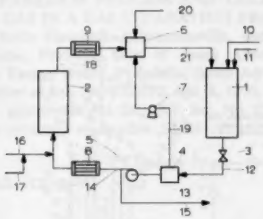
circuit for cycling at least part of the contents of reactor A to reactor B and then back to reactor A, through said first and said second conduit means;

a third conduit means communicating with said circuit, for feeding reactants and solvents into said circuit;

a discharge means, communicating with said circuit, for discharging at least a part of the contents of said circuit;

said circuit equipped with means for causing a flow of the contents of that circuit;

wherein said means for causing flow comprises a relief valve and a compressor, said relief valve being disposed in said first conduit means and communicating with the interior of said first conduit means and said compressor being in communication with said second conduit means, wherein said relief valve and said compressor allow polymerization in reactor A to occur at a different pressure from the pressure of polymerization in reactor B;



through reactor A, said second conduit means, reactor B, said first conduit means and reactor A, respectively, and said circuit being equipped with cooling means to remove heat of polymerization generated during the operation of said installation;

a vapor separator being in communication with said first conduit means, in a position between said relief valve and said inlet of reactor A;

a fourth conduit means disposed between, connecting and in communication with said first and second conduit means, and in communication with said vapor separator;

an absorber disposed in and in communication with said second conduit means, said absorber being between the inlet of reactor B and said compressor; and

a fifth conduit means being in communication with said circuit in a position after said outlet means of reactor A.

4,113,441

STEAM REFORMING REACTOR

Akira Suzuki, Tokyo; Kantaro Nakamura, Yokohama; Tetsuo Maejima, Kiyose; Masaru Kajiura, Tokyo; Toshio Aso, Kawasaki; Shoichi Abe, Yokohama; Toshihisa Suzuki, Yokohama; Katsuaki Takemura, Yokohama; Masaya Kuno, Machida; Kazumichi Yoshida, Yokohama; Junji Yokokawa, Yamato; Takeshi Miyasugi, Yokohama; Hiroshi Yagi, Tokyo, and Kiyohisa Mukai, Yokohama, all of Japan, assignors to Director-General Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 7, 1977, Ser. No. 775,373

Claims priority, application Japan, Mar. 9, 1976, 51-24618

Int. Cl.[2] B01J *8/06*

U.S. Cl. 422—197 **12 Claims**

1. A steam reforming reactor comprising:

a pressure shell having inlet and outlet nozzles for each of process gas and heating gas, and a thermal insulating layer made of thermal insulating material provided on at least a part of the inner surface of the pressure shell;

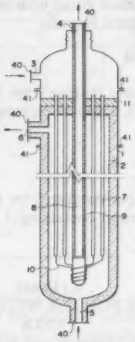
a plurality of catalyst tubes, each having two ends and being made of metal, the catalyst tubes being packed with a catalyst and located substantially vertically within the pressure shell, one end of each catalyst tube being communicated with the inlet nozzle of the process gas;

a riser pipe having two ends and being located substantially vertically within the pressure shell, the riser pipe having a thermal insulating layer made of thermal insulating material on the outer surface thereof, one end of the riser pipe being terminated in the outlet nozzle of the process gas;

a plurality of pipes connecting the other ends of the catalyst tubes to the other end of the riser pipe, said plurality of pipes having a smaller diameter than the catalyst tubes and riser pipe and taking up the difference in thermal expansion between the catalyst tubes and the riser pipe;

a baffle provided around the catalyst tubes to accelerate the transfer of heat from the heating gas to the catalyst tubes;

a cylindrical member around the outer periphery of the baffle to prevent a short flow path of the heating gas;



an annular plate assembly mounted on the cylindrical member and embedded in the thermal insulating layer on the pressure shell, the annular plate assembly comprising at least two annular plates disposed coaxially and overlapping partly on each other, one plate being outermost relative to the other, the outermost plate being secured in the pressure shell and the innermost plate being provided with a ground type seal mechanism having peripheral stuffing box within its inner periphery to take up the difference in thermal expansion between the cylindrical member and the pressure shell by sliding with the cylindrical member and to prevent a short flow path of the heating gas; and

a support member provided on the pressure shell to support the catalyst tubes and the riser pipe.

4,113,442

MIDDLE DISTILLATE FUEL COMPOSITIONS

Siebe Hoff; Gerhardus Ockers; Arnold A. Buitelaar, and Eduard J. Van De Kraats, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 772,383, Feb. 28, 1977, abandoned, which is a continuation of Ser. No. 618,082, Sep. 30, 1975, abandoned. This application Mar. 21, 1977, Ser. No. 779,645

Claims priority, application United Kingdom, Mar. 17, 1976, 10696/76

Int. Cl.[2] C10L *1/18*

U.S. Cl. 44—66 **19 Claims**

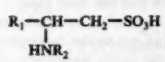
1. A middle distillate fuel composition of improved filterability, comprising a middle distillate fuel and, as filterability improver, from 50 to 800 parts per million, based on said fuel composition, of a C_{10}-C_{40} hydrocarbyl ester of a hydroxy-alkyl carboxylic acid in which the C_{10}-C_{40} hydrocarbyl group includes at least one uninterrupted chain of at least 8 methylene groups.

4,113,443
ANTISTATIC ADDITIVES

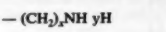
J. Ronald Spence, Warrenville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 27, 1977, Ser. No. 810,291
Int. Cl.[2] C10L 1/24
U.S. Cl. 44—72 11 Claims

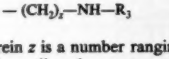
1. A hydrocarbon composition having properties which prevents static charge buildup comprising a major proportion of a hydrocarbon and an effective amount of an antistatic additive of the general formula



wherein R_1 is an alkyl or alkenyl group of 1 to 24 carbon atoms, and R_2 is a hydrocarbon group with less than 18 carbon atoms, a radical of the general formula



wherein x is a number ranging from 1 to 6 and y is a number ranging from 1 to 5, a radical represented by the general formula



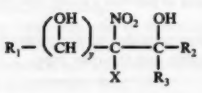
wherein z is a number ranging from 1 through 5 and R_3 is an alkyl or alkenyl group containing 1 to 24 carbon atoms or hydrogen.

4,113,444
MICROBICIDE FOR USE WITH HYDROCARBON FUELS

Pamela M. Bunting, Cheswick, and John F. Deffner, Glenshaw, both of Pa., assignors to Gulf Research & Development Co., Pittsburgh, Pa.

Filed Dec. 17, 1976, Ser. No. 751,256
Int. Cl.[2] C10L 1/22
U.S. Cl. 44—72 13 Claims

1. A process for inhibiting the growth of gel-forming microorganisms in a binary liquid system comprising a major amount of a liquid distillate hydrocarbon fuel and a minor amount of an aqueous phase, which comprises adding to said binary liquid system a microbicidal amount of a water soluble halonitro alcohol of the formula:



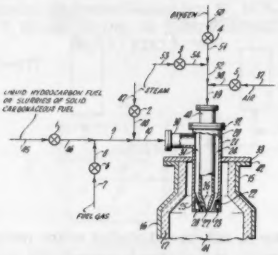
wherein R_1, R_2 and R_3 are either alike or different members selected from hydrogen or alkyl having from 1 to about 7 carbon atoms; and Y is an integer selected from 0 or 1; and X is selected from bromine, chlorine or iodine.

4,113,445
PROCESS FOR THE PARTIAL OXIDATION OF LIQUID HYDROCARBONACEOUS FUELS

Hans Gettert, Mannheim; Arnulf Jeck, Neustadt, and Dietmar Werner, Weisenheim, all of Fed. Rep. of Germany, assignors to Texaco Development Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,744
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1977, 2703921
Int. Cl.[2] C10J 1/00
U.S. Cl. 48—197 R 7 Claims

1. In a partial oxidation process for producing gaseous mixtures comprising H_2 and CO, and at least one material from the group H_2O, CO_2, H_2S, COS, CH_4, N_2, NH_3, and Ar, and entrained particulate carbon by the partial oxidation of a liquid hydrocarbonaceous fuel with a free-oxygen containing gas optionally with a temperature moderator in a free-flow, noncatalytic refractory lined, gas generator at a temperature in the range of about 1800° to 3000° F. and a pressure in the range of about 1 to 250 atmospheres, including preheating the reaction zone of said gas generator at atmospheric pressure by introducing fuel gas into said reaction zone by means of a preheat burner and by the complete combustion of said fuel gas with air, stopping said flow of said fuel gas and air and removing said preheat burner from the gas generator, replacing said preheat burner with an annulus-type main burner, the improvement comprising removing said preheat burner from the gas generator when said reaction zone reaches a temperature in the range of about 1832° to 2012° F.; introducing air or compressed air in excess of stoichiometric into said reaction zone by way of one passage of said main burner and continuously passing fuel gas through another passage of said main burner, heating said



reaction zone by complete combustion of said fuel gas and air at a pressure in the range of about 0.5 to 1.0 atmospheres, connecting said main burner pressure tight to said reaction zone and continuing heating said reaction zone at a pressure in the range of about 0.5 to 250 atmospheres until the temperature required for ignition of the autothermal partial oxidation reaction of the liquid hydrocarbonaceous fuel and free oxygen containing gas in the presence of a temperature moderator in the range of about 2192° to 2642° F. is reached; stopping the flow of said streams of fuel gas and air and passing a stream of liquid hydrocarbonaceous fuel optionally in admixture with a temperature moderator through the same passage in said main burner that formerly carried said fuel gas, and passing a stream of free-oxygen containing gas optionally in admixture with a temperature moderator through the same passage in said main burner that formerly carried said air; and mixing said streams together to form a mixture, and igniting said mixture at atmospheric pressure and bringing said reaction zone up to operating pressure to produce said gaseous mixtures.

4,113,446
GASIFICATION PROCESS

Michael Modell, Cambridge; Robert C. Reid, Lexington, both of Mass., and Sanjay I. Amin, Kalamazoo, Mich., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 598,102, Jul. 22, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,712
Int. Cl.[2] C10J 3/16
U.S. Cl. 48—202 10 Claims

1. The process for forming a gas composition having a high heating value which comprises reacting a liquid or solid organic material with water wherein the water is at least at its critical temperature and wherein the water pressure is at least at its critical pressure such as to achieve the critical density of water and recovering a gas product from the reaction without significant char formation.

4,113,447
METHOD OF CONDITIONING FLUE GAS

Robert P. Bennett, Bridgewater, and Alfred E. Kober, Hopatcong, both of N.J., assignors to Apollo Chemical Corporation, Whippany, N.J.

Filed May 2, 1977, Ser. No. 792,939
Int. Cl.[2] B03C *3/00*
U.S. Cl. 55—5 28 Claims

1. A method of conditioning a particle-laden gas formed by the burning of coal comprising forming a mixture of:

(A) the particle-laden gas at a temperature of 200°–900° C., and

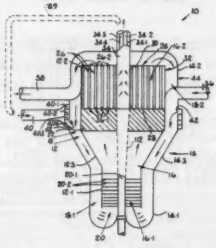
(B) finely divided sodium bisulfate; said mixture containing 75–1250 grams of sodium bisulfate per metric ton of coal burned to form said gas;

and thereafter passing the mixture through an electrostatic precipitator.

4,113,448
GAS SEPARATION PROCESS AND TREATMENT OF A GAS IN A GAS SEPARATION PROCESS

Pierre Cloete Haarhoff, Schoemansville, and Werner Adolf Schumann, Pretoria, both of South Africa, assignors to Atomic Energy Board, Pelindaba, South Africa

Continuation of Ser. No. 673,572, Apr. 5, 1976, abandoned. This application Jul. 25, 1977, Ser. No. 819,016
Claims priority, application South Africa, Apr. 17, 1975, 75/2442
Int. Cl.[2] B01D *57/00*
U.S. Cl. 55—17 24 Claims



1. In a separation process wherein a gas is passed through a cascade made up of a plurality of stages each comprising a separator, the method which includes the steps of:

withdrawing the gases issuing from the separators of a plurality of stages in the cascade to a single compressor, the gases from at least some of the separators having different compositions;

combining said gases to form a single stream the composition of which varies in a known fashion over a cross-section of the stream transverse to the direction of movement of the stream from a minimum with respect to the concentration of one of the gases being separated to a maximum with respect to said concentraton;

passing the stream through said single compressor without destroying the variation in composition;

separating the stream into a plurality of parts, at least some of which have different compositions; and

passing said parts through further stages in the cascade.

14. For a separation process wherein a gas is passed through a cascade made up of a plurality of stages each comprising a separator, the apparatus which comprises:

a compressor;

a plurality of separators arranged so that they are in different stages in the cascade;

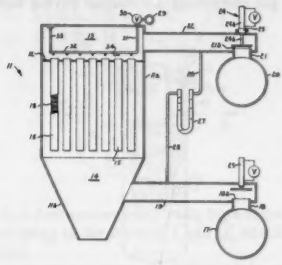
conduit means for withdrawing gases of different compositions from various separators to the compressor and for combining said gases to form a single stream the composition of which varies in a known fashion over a cross-section of the stream transverse to the direction of movement of the stream from a minimum with respect to the concentration of one of the gases being separated to a maximum with respect to said concentration, and for feeding said stream to the compressor; and

means for separating the stream issuing from the compressor into a plurality of parts at least some of which have different compositions, and for passing said parts through further stages in the cascade.

4,113,449
BAGHOUSE CLEANING METHOD

Richard P. Bundy, Prairie Village, Kans., assignor to Standard Havens, Inc., Kansas City, Mo.

Filed Aug. 26, 1977, Ser. No. 827,942
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—96 2 Claims



1. In a baghouse comprising a housing, a partition disposed within and sealed against said housing defining a first chamber on one side of said partition and a second chamber on the other side thereof, an inlet conduit connected to said housing for directing a process gas stream containing particulate matter into said first chamber, an outlet conduit communicating with said second chamber to exhaust process gas therefrom, a plurality of gas passages through said partition establishing communication between said first and second chambers, and a plurality of filter assemblies associated with said gas passages for removing particulate matter from process gas flowing from said first chamber to second chamber, each said filter assembly comprising a cylindrical fabric sleeve having an open end portion sealingly secured to a gas passage through said partition, an elongate tubular portion and a closed end portion extending into said first chamber, and a cylindrical foraminous cage disposed with said sleeve for skeletal support; a method of cleaning said filter assemblies comprising the steps of:

restricting process gas flow through said housing to establish a pressure drop from said first chamber to said second chamber in the range of $\frac{1}{4}$ to $1\frac{1}{4}$ inches water gauge; and

delivering an intermittent blast of high pressure cleaning gas to said filter assemblies to dislodge particulate matter collected thereon.

4,113,450
METHOD AND DEVICE RELATING TO SEPARATION OF LIQUID FROM LIQUID-CONTAINING COMPRESSED GAS

Lars Roland Goransson, Berchem, Belgium; Gosewinus Franciscus van Oorschot, Breda, Netherlands, and Jan Gustaaf Pittoors, Boechout, Belgium, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 15, 1976, Ser. No. 750,835
Claims priority, application Sweden, Dec. 23, 1975, 146514/75
Int. Cl.[2] B01D *45/16*
U.S. Cl. 55—97 7 Claims

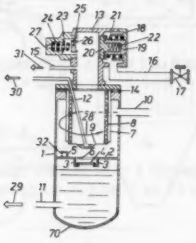
1. In the two-stage method of separating liquid from compressed air in liquid injected compressor systems and the like, in which the major portion of the liquid is removed from the

compressed gas in the first stage by introducing the compressed air and liquid mixture eccentrically in a container, and collected under pressure in a bottom collection zone thereof, remaining liquid being removed in the second stage by passing the compressed air and residual liquid resulting from the first stage into a filter zone normally in communication with the bottom collection zone, the improvement preventing blowback of liquid collected in the first stage into the filter zone of the first stage, comprising:

(a) sealing the pressurized liquid collected in the first stage from the compressed gas and residual liquid in the second stage when the pressure in the system falls below a predetermined value; and

(b) gradually equalizing the pressure between the first stage and the second stage.

2. A device for separating liquid from liquid-containing compressed gas comprising a container having liquid collecting means, a conduit for supplying compressed liquid-containing gas to the container, said conduit being eccentrically connected to the container so that the container acts as a first stage cyclone separator for the liquid, a filter unit in said container acting as a second stage separator for the liquid, said second stage separator being in flow communication with said first stage separator, said container comprising wall means situated between the filter unit and the liquid collecting means, said wall means comprising a hole to allow liquid to flow through the wall means towards the liquid collecting means, valve means for automatically closing said hole when the pressure at the filter unit is lower than at the liquid collecting means so that collected liquid is automatically prevented from expanding into the filter unit, and a bleeder hole being provided for establishing a flow communication between the two sides of said wall means to allow the pressure at the liquid collecting means to slowly decrease to the pressure prevailing at the filter unit.



4,113,451

COMPRESSED GAS FILTER ASSEMBLY

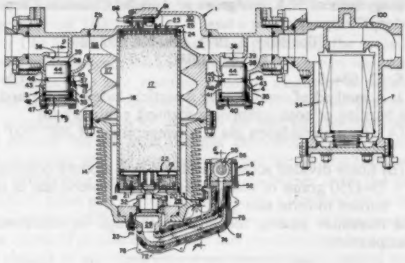
Virgil L. Frantz, Salem, Va., assignor to Graham-White Sales Corp., Salem, Va.

Filed Jun. 8, 1977, Ser. No. 804,733

Int. Cl.[2] B01D *53/00*

U.S. Cl. 55—162 **11 Claims**

1. A compressed gas filter assembly comprising filter unit means having housing means containing a desiccant and fitted with pneumatically opened and closed inlet and outlet check valve means and pneumatically opened spring-closed drain valve means for respectively passing unfiltered gas to and filtered gas from and draining any collected contaminant from said housing means, said filter unit means alternating between filtering cycles wherein said inlet and outlet valve means are open and said drain valve means closed and regenerating cycles wherein said inlet and outlet valve means are closed and said drain valve means open in response to exhausting of actuating compressed gas from said inlet and outlet valve means and supply of said gas to said drain valve means, and means so connecting all of said valve means to each other and a source of actuating compressed gas as to cause said inlet and outlet valve means to open after closing and close before opening of said drain valve means.



4,113,452

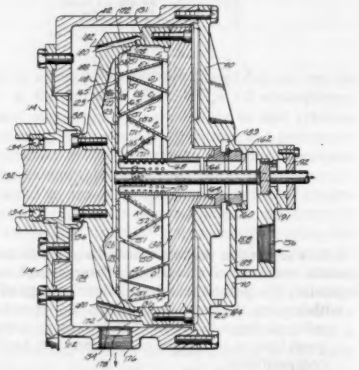
GAS/LIQUID SEPARATOR

Francis Barton Brown, La Crescenta, and John W. Erickson, Huntington Beach, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Continuation-in-part of Ser. No. 600,844, Jul. 31, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,581

Int. Cl.[2] B01D *45/12*

U.S. Cl. 55—203 **17 Claims**



1. Apparatus for degasification of liquids comprising:

a rotatable degassing chamber;

means for feeding liquid containing gas into the chamber;

means for venting gas from the chamber;

a plurality of baffles within the chamber providing a flow path for the liquid comprising a series of truncated, baseless, hollow, coaxial right circular cones, coaxial with the chamber and with progressively larger diameters, the open bases of adjacent conical baffles facing in opposite directions, the smaller ends of one set of baffles closed by one end wall of the chamber, and the smaller ends of the intervening baffles closed by the opposite end wall, the edge of the base of each baffle interleaved with and spaced from the inner surface of the next outer baffle to provide a fluid flow path along the inner walls of the baffles; and

a discharge passage from the rotatable chamber for discharging liquid from the inside of the chamber near a circumferential wall of the chamber to the outside of the chamber due to centrifugal acceleration of the chamber, the discharge passage having both a radially innermost wall and

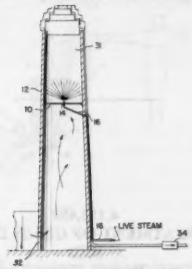
a radially outer most wall extending from an entrance port inside the chamber to an exit port outside the chamber, the radially innermost wall of the discharge passage having a portion upstream from said exit port which is radially farther from the chamber axis of rotation than is the radially outermost wall of said discharge passage at said exit port for forming a gas seal in the passage.

4,113,453

ANTI-POLLUTION DEVICE FOR INDUSTRIAL STACKS

Charles B. Rector, Buckhorn Lake St. Pk., Buckhorn, Ky. 41721

Filed Jun. 28, 1977, Ser. No. 811,129
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—263 **2 Claims**



1. In combination with an industrial stack that serves as a chimney, an anti-pollution system which conveys pollutants such as unburned particles and soot from the stack gases exhausted by the stack, comprising

a vertical stack for exhausting gases of combustion led into the lower end of said stack,

a source of steam terminating in a nozzle mounted in an upper portion of said stack, said nozzle oriented to spray the inner circumference of the stack with steam, so as to spray the combustion gases in said stack,

said stack fitted above its upper extremity adjacent and above the outlet of the stack with a plurality of sets of cooling coil means with each set of cooling coil means formed as a coil along a cylindrical path concentric within the axis of the stack, with each set of such coils formed along a cylindrical path of a lesser diameter than the set below the said set, with

circular drain means mounted immediately below each set of cooling coil means for collecting water containing pollutants that has been condensed by the cooling coil means from steam sprayed into the stack,

said drain means joined to a filter for separating said pollutants from the condensed water,

said cooling coils and drain means enclosed about their external radial periphery by an outer filter means for prevention of passage of condensed water vapor which means permits passage of exhaust stack gas so that water vapor condensed by said coils cannot escape in the radial outward direction from said stack.

4,113,454

COATING FILTER, SEPARATOR AND COLLECTOR SYSTEM

Daniel S. Cvacho, Forest, Va., assignor to Belgium Tool & Die Co., Lynchburg, Va.

Filed Sep. 28, 1976, Ser. No. 727,447
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—319 **5 Claims**

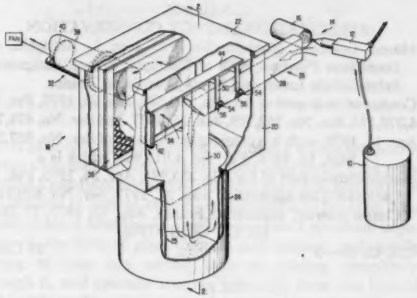
1. An apparatus for collecting the overspray of a coating system which comprises:

(a) a collection receptacle for receiving solid particles from the overspray of said coating system,

(b) a main support means attachable to said collection receptacle,

(c) a first duct system held by said main support means having an inlet end adapted to be positioned adjacent a coating station and an outlet end positioned within said collection receptacle,

(d) a second duct system held by said main support means having an inlet end in fluid communication with the outlet end of said first duct system,



(e) said first duct system being made from disposable materials and being in the form of a pair of interfitting tubular members,

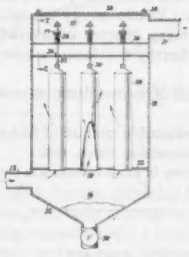
(f) said main support means including a tube support frame having a plug member over which a first of said pair of tubular members is telescoped and frictionally received thereon and the other of said tubular members is inserted through a side wall of the first tubular member and provided with a truncated end to provide a right angle turn for the overspray materials.

4,113,455

BAG TENSIONING ARRANGEMENT

Donald Louis Richmond, Scio, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Dec. 21, 1977, Ser. No. 862,894
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—378 **3 Claims**



1. Apparatus for filtering solids from a carrier gas comprising a housing having an inlet duct for dust bearing carrier gas and an outlet duct for clean gas from which dust has been removed, an apertured tube sheet comprising a plurality of apertures and extending across said housing to provide an inlet compartment adjacent the inlet duct and an outlet compartment adjacent the outlet duct, a plurality of tubular filter bags each having an open end thereof attached to the periphery of one of said apertures of the tube sheet and a closed end extending axially therefrom, means for holding the filter bags in an

extended condition comprising an apertured beam extending across said housing, a linkage rod extending axially from the closed end of each filter bag through an aperture of said beam, spring means biasing each linkage rod axially relative to said beam to hold each filter bag in an extended condition, and spring adjusting means slidably mounted on each linkage rod to vary the tension of the spring biasing means on each of the filter bags.

4,113,456

FIBERIZATION ENERGY CONSERVATION

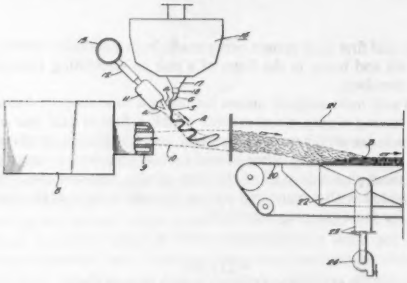
Marcel Levecque, Birchrunville, Pa.; Jean A. Battigelli, and Dominique Plantard, both of Rantigny, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 780,589, Jan. 24, 1977, Pat. No. 4,070,173, Ser. No. 762,789, Jan. 25, 1977, and Ser. No. 676,755, Apr. 14, 1976, each is a continuation-in-part of Ser. No. 557,282, Mar. 11, 1975, Pat. No. 4,015,964, which is a continuation-in-part of Ser. No. 353,984, Apr. 24, 1973, Pat. No. 3,885,940. This application Aug. 31, 1977, Ser. No. 829,515

Claims priority, application France, Aug. 23, 1977, 77 25695

Int. Cl.[2] C03B *37/06*

U.S. Cl. 65—5 **14 Claims**



12. A method for attenuating a thermoplastic material comprising

generating a gaseous blast,

generating a plurality of gaseous jet flows, each jet flow having a smaller cross sectional dimension than that of the blast in a direction transversely of the blast, each jet flow having a greater kinetic energy per unit of volume than the blast and being directed transversely into the blast, each jet flow thereby developing a zone of interaction in the blast,

delivering a stream of thermoplastic material into each interaction zone,

developing a combustible mixture of fuel and comburent in each of said interaction zones, and

igniting the mixture in each interaction zone.

4,113,457

APPARATUS FOR SUPPLYING GLASS BODIES TO GLASS MELTERS

Charles J. Stalego, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 10, 1977, Ser. No. 758,109

Int. Cl.[2] C03B *37/02*

U.S. Cl. 65—11 R **6 Claims**

1. Apparatus for producing glass filaments comprising a marble hopper, a bushing, and means for feeding glass marbles sequentially from said hopper to said bushing, said bushing comprising means for melting the glass marbles and means for attenuating the molten glass into filaments, said feeding means comprising a conduit for generally spherical objects compris-

ing a plurality of substantially coaxial helically wound wires, the wires being spaced apart by an ejector opening.

4,113,458

THERMAL TREATMENT OF GLASS IN A FLUIDIZED BED

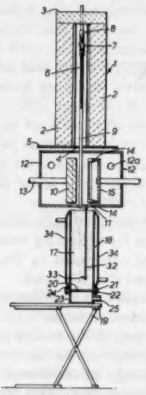
Raymond Peter Cross, Preston, England, assignor to Pilkington Brothers Limited, St. Helens, England

Continuation of Ser. No. 717,171, Aug. 24, 1976, abandoned. This application Nov. 8, 1977, Ser. No. 849,632

Claims priority, application United Kingdom, Aug. 29, 1975, 35769/75; Jun. 10, 1976, 24123/76

Int. Cl.[2] C03B *27/00*

U.S. Cl. 65—114 **16 Claims**



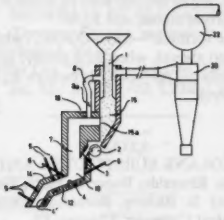
1. In a method of thermally treating glass in which the glass is contacted with a gas-fluidised particulate material to effect heat transfer between the surfaces of the glass and the fluidised material, and wherein gas is fed to said particulate material under pressure from an external source, the improvement wherein said gas-fluidised particulate material with which the glass is contacted is placed in a quiescent uniformly expanded state of particulate fluidisation through control of the gas feed such that the gas velocity while the glass is being contacted by said particulate material is between that velocity corresponding to incipient fluidisation and that velocity corresponding to maximum expansion.

4,113,459

METHOD AND APPARATUS FOR MELTING MINERAL MATERIALS

Rene Mattmuller, Malakoff, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 602,670, Aug. 7, 1975, abandoned. This application Feb. 10, 1977, Ser. No. 767,441
Claims priority, application France, Nov. 2, 1976, 76 03720; Aug. 14, 1974, 74 28188
Int. Cl.² C03B 3/00
U.S. Cl. 65—135 35 Claims



1. The method of obtaining a molten vitreous mass comprising the steps of:
(a) supplying the raw material to be melted in the form of solid granular elements with each element containing essentially the components in the proportions necessary for the formation of said molten mass;
(b) preheating the elements to a temperature below the fritting temperature at which the raw material becomes tacky;
(c) depositing the elements onto a molten surface of a thin receiving layer previously formed from the raw material;
(d) subjecting the raw material which is deposited onto the molten surface to an intense heating by hot gaseous currents to effect melting of the raw material;
(e) moving a portion of the resulting molten mass along a path extending away from the location of deposit of the raw material to leave a receiving layer with a molten surface; and
(f) recovering the vitreous molten mass.

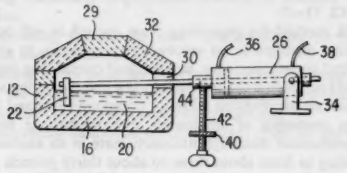
8. Apparatus for obtaining a molten vitreous mass comprising:
(a) a hearth;
(b) heating means for heating the hearth;
(c) supply means for supplying the raw material to be melted to a location overlying the hearth, the raw material being in the form of solid granular elements with each element essentially containing the totality of components in the proportions necessary for the formation of the mass;
(d) preheating means for preheating the raw material at said location to a temperature below its fritting point;
(e) means for depositing the raw material onto the hearth;
(f) heating means for directing hot gases toward the hearth and onto said raw material in a direction approximately perpendicular thereto for effecting a rapid and homogeneous melting of the raw material to a molten mass at the location of deposit of said raw material; and
(g) means for moving a portion of the resulting molten mass along said hearth in a direction away from the location of deposit of the raw material and to a point of discharge from the apparatus and at a speed sufficient to continuously maintain a thin layer of the molten mass at said location after initial formation of said layer.

4,113,460

MOLTEN GLASS HOMOGENIZER

H. Larry Penberthy, 631 S. 96th St., Seattle, Wash. 98108

Filed May 20, 1977, Ser. No. 798,879
Int. Cl.² C03B 5/18
U.S. Cl. 65—178 16 Claims



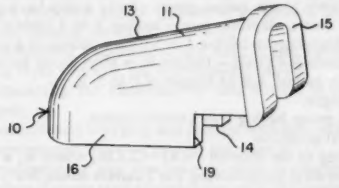
1. A glass mixing arrangement comprising a glass forehearth having a channel through which molten glass flows, a flat plate forming a paddle in said forehearth, said plate being oriented in said channel to present its thinnest dimension to the glass flow in said channel whereby said paddle presents a minimum impedance to the flow of glass through said channel, said paddle having at least one mixing aperture passing completely through it, said aperture slanting upwardly from one face of said paddle to the other, a drive rod coupled to said paddle and extending laterally of said channel out of said forehearth, and oscillatory drive means coupled to said rod for driving said paddle with substantially reciprocating motion transversely across said channel from adjacent one forehearth side wall to the other with the lower edge of said paddle near the bottom of the forehearth.

4,113,461

HOOD FOR GLASS FURNACE GATHERING HOLE

Michael R. Sturm, 137 Ridgeway Dr., Bridgeport, W. Va. 26330

Filed Sep. 14, 1977, Ser. No. 833,264
Int. Cl.² C03B 5/26
U.S. Cl. 65—324 5 Claims



1. A hood for a glass furnace gathering hole comprising:
(a) a hollow elongated body member of generally inverted U-shape having two side walls, a closer rear end wall, an open front end, and an open bottom, said body being adapted to fit longitudinally through the gathering hole in the wall of a glass furnace and so seat on the bottom edges of said two side walls as to cause said rear end wall to tilt down into the furnace; and
(b) a collar of inverted U-shape integral with the body member at the open front end thereof, said collar being of a diameter greater than that of the glass furnace gathering hole for engaging the furnace wall at the gathering hole in the tilted position of the body member to provide a seal and for preventing the body member from passing completely through the gathering hole.

4,113,462
PROMOTION OF PLANT GROWTH WITH COMPOSITIONS CONTAINING A DITHIOCARBAMIC ACID DERIVATIVE

Romeo Barrick Wagner, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 20, 1977, Ser. No. 789,303
Int. Cl.[2] C05C *3/00, 9/00*
U.S. Cl. 71—7 **8 Claims**

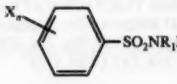
1. A method for improving plant growth in soil containing fertilizer nitrogen in an amount corresponding to about one hundred pounds per acre, said method comprising impregnating said soil below the soil surface in a plant growing area with at least one nitrification inhibitor compound selected from the group consisting of ammonium dithiocarbamate and dimethylammonium dimethyldithiocarbamate in an amount corresponding to from about three to about thirty pounds per acre where said amount is effective to inhibit nitrification of the reduced nitrogen in the soil.

4,113,463
METHOD FOR CONTROLLING THE GROWTH OF PLANTS

Hiromichi Oshio; Hiroyuki Konishi; Shiunzi Matsumura; Kikuichi Ishikawa, and Eiichi Yoneyama, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 616,995, Sep. 26, 1975, Pat. No. 4,070,176.
This application Mar. 11, 1977, Ser. No. 776,618
Claims priority, application Japan, Oct. 8, 1974, 49-116639; Jul. 2, 1975, 50-82157; Jul. 30, 1975, 50-93578
Int. Cl.[2] A01N *9/14*
U.S. Cl. 71—76 **15 Claims**

1. A method for regulating the elongation of plants so as to increase their resistance to lodging, characterized by applying a plant regulating effective amount of a plant growth regulator containing as active ingredient a benzenesulfonamide derivative represented by the general formula,



wherein X is a halogen atom, alkyl group having 1 to 5 carbon atoms, nitro group, amino group, alkoxy group having 1 to 5 carbon atoms, alkylthio group having 1 to 5 carbon atoms, alkylsulfonyl group having 1 to 5 carbon atoms, or a group of the formula R_3CONH— (where R_3 is alkyl group having 1 to 5 carbon atoms); n is an integer of 0 to 5; R_1 is

hydrogen,

alkyl group having 1 to 5 carbon atoms,

phenyl group, or

a group of the formula —(A)—$COOR_4$ where R_4 is hydrogen, alkyl group having 1 to 5 carbon atoms, Na^+, K^+, or NH_4^+ ion, and

(A) is a group of the formula —$(CH_2)_m$— (where m is an integer of 1 to 3), or a group of the formula

(where R_5 and R_6 are either hydrogen and alkyl group having 1 to 5 carbon atoms or are both alkyl groups having 1 to 5 carbon atoms); and R_2 is

hydroxyl group, aminoalkyl group having 1 to 5 carbon atoms, cyano-C_{1-5}-alkyl group, a group of the formula HSO_3—R— where R is an alkyl group having 1 to 5 carbon atoms, phenyl-substituted alkyl group having 1 to 5 carbon atoms, or a group of the formula —(A)—$COOR_4$ (where R_4 and (A) are as defined above), when R_1 is hydrogen; R_2 is

a group of the formula —(A)—$COOR_4$ (where R_4 and (A) are as defined above), or a group of the formula —(B)—$OOCR_7$ where R_7 is phenyl group and (B) is a group of the formula $(CH_2)j$- (where j is an integer of 1 to 3), or a group of the formula

(where R_5 and R_6 are as defined above), when R_1 is alkyl group having 1 to 5 carbon atoms; and R_2 is

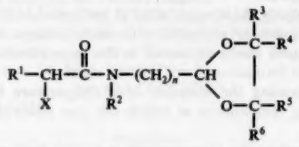
a group of the formula —(A)—$COOR_4$ (where R_4 and (A) are as defined above), when R_1 is phenyl group or a group of the formula —(A)—$COOR_4$ (where R_4 and (A) are as defined above).

4,113,464
DIOXOLANE SUBSTITUTED AMIDES

Leonard J. Stach, Riverside; Roger D. Hotz, Evanston, both of Ill., and Sidney B. Richter, Barberton, Ohio, assignors to Velsicol Chemical Company, Chicago, Ill.

Filed Apr. 4, 1977, Ser. No. 784,212
Int. Cl.[2] A01N *9/20*; C07D *317/10*
U.S. Cl. 71—88 **10 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of hydrogen and alkyl; X is halogen; R^2 is selected from the group consisting of alkyl, alkenyl and alkynyl; n is the integer 1 or 2; and R^3, R^4, R^5 and R^6 are each selected from the group consisting of hydrogen and alkyl.

9. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, a herbicidally effective amount of a compound of claim 1.

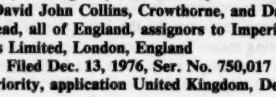
10. A method of controlling weeds which comprises contacting said weeds with a herbicidally effective amount of a herbicidal composition of claim 9.

4,113,465
HERBICIDAL FORMULATIONS

Margaret Claire Shephard, Maidenhead; Balsubramanyan Sugavanam, Wokingham; Paul Anthony Worthington, Maidenhead; David John Collins, Crowthorne, and David Griffin, Maidenhead, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Dec. 13, 1976, Ser. No. 750,017
Claims priority, application United Kingdom, Dec. 16, 1975, 51458/75
Int. Cl.[2] A01N *9/22*; C07D *249/08*
U.S. Cl. 71—92 **8 Claims**

1. A compound of the formula:



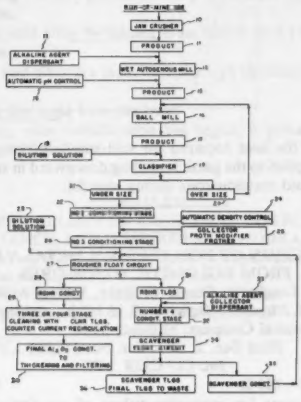
wherein rings A and B are unsubstituted, or carry one or more

substituents, each substituent being a lower alkyl radical; a fluorine, chlorine, bromine, or iodine atom; a lower alkoxy radical; a cyano group; a nitro group; a lower alkylcarbonyloxy radical; a methylenedioxy radical; an amino group; or a mono- or di- lower alkyl substituted amino group, and wherein Het stands for a 1,2,4-triazol-1-yl radical, at least one of the rings A and B being substituted; and salts of compounds of the foregoing formula.

4,113,466
CONCENTRATION OF HYDRATED ALUMINUM OXIDE MINERALS BY FLOTATION

David Weston, Toronto, Canada, assignor to Reynolds Metals Company, Richmond, Va.

Filed Oct. 28, 1976, Ser. No. 736,466
Int. Cl.² B03D *1/02*; C22B *1/00*
U.S. Cl. 75—2 **56 Claims**



1. A process for the concentration by flotation of hydrated aluminum oxide minerals from hydrated aluminum oxide bearing raw materials comprising: subjecting the said raw materials to at least three stages of conditioning prior to rougher flotation, the said at least three stages of conditioning comprising: a wet grinding circuit in which the said grinding of the said raw materials to form a pulp is carried out in the presence of a selected dispersing agent in controlled amounts to effectively and beneficially disperse the solids contained in said pulp to produce a product to said flotation varying between about 55 to 95% minus 500 mesh; subsequently subjecting the said pulp to a mechanical agitation conditioning stage in which the said pulp is mechanically agitation conditioned in the presence of at least an alkaline dispersing agent at an optimum pH point within the pH range of about 7.5 to 11.5 for a sufficient period of time to precipitate deleterious salts from the said pulp and beneficially affect the surfaces of the said aluminum oxide minerals for optimization of the said flotation of the said aluminum oxide minerals; subsequently subjecting the said mechanically agitation conditioned pulp to a further mechanical agitation conditioning stage at an optimum pH point in the range of about 7.5 to 11.5 and in the presence of a differential activating and flocculating agent comprising one or more agents selected from the group consisting of oxyhydryl anionic collectors to activate and flocculate the said aluminum oxide minerals; subsequently subjecting the said conditioned pulp to flotation to produce a rougher concentrate enriched in the said aluminum oxide minerals and rougher tailings impoverished in the said aluminum oxide minerals.

4,113,467
PROCESS FOR RECOVERING GOLD

Douglas S. Harrington, 1276 Fairfax St., Denver, Colo. 80220

Filed Feb. 22, 1977, Ser. No. 770,466
Int. Cl.² C22B *11/04*
U.S. Cl. 75—0.5 A **17 Claims**

1. A process for recovering precious metals selected from the group consisting of gold and silver from solution which comprises:

(a) adsorbing the solution onto sodium silicate to form a gelid reaction component;

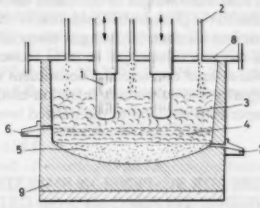
(b) adding to the gelid reaction component a reducing agent for the precious metal to cause a reduction reaction catalyzed by the silicon-containing compound;

(c) recovering elemental precious metal from the gel.

4,113,468
CONTINUOUS SMELTING METHOD

H. W. Gudenau, Aachen; Horst König, Duisburg; Gero Rath, Mulheim, and Haye Roth, Breitscheid, all of Fed. Rep. of Germany, assignors to Demag, A.G., Duisburg, Fed. Rep. of Germany

Filed Feb. 24, 1977, Ser. No. 771,748
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1976, 2608320
Int. Cl.² C21C *5/52*
U.S. Cl. 75—12 **1 Claim**



1. A method for continuously making substantially pure steel having a very low carbon content in an electric low shaft resistance furnace, the steps comprising

(a) maintaining a continuous slag layer in said furnace, said slag layer covering the molten metal therein;

(b) immersing the electrodes for said furnace in said slag layer;

(c) continuously charging said furnace with iron sponge; the improvement characterized by the steps of

(d) pre-reducing said iron sponge prior to charging to a carbon/oxygen ratio of within the range of between about 1:1.4 and 1:1.55;

(e) increasing the volume of said slag layer in said furnace by foaming a portion of said slag layer, the ratio of the volume of the non-foaming portion of said slag layer to said foaming portion being within the range of between about 1 to 1.2 and 1 to 5 ;

(f) maintaining continuously said volume of said slag layer obtained in step (e);

(g) said increasing and maintaining steps being carried out with a fluid and reactive basic slag containing calcium oxide and silicon dioxide;

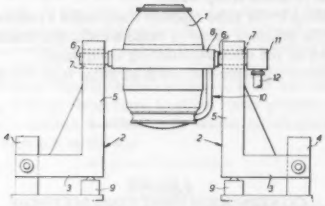
(h) said slag having an iron oxide content within the range of between about 7 and 30% and a magnesium oxide content within the range of between about 5 and 12%; and

(i) withdrawing continuously said substantially pure product from said furnace.

4,113,469
REFINING MOLTEN METAL

Hugh W. Grenfell; David J. Bowen, both of Swansea, Wales, and Robert Baker, Sheffield, England, assignors to British Steel Corporation, Great Britain

Filed May 2, 1977, Ser. No. 792,602
Claims priority, application United Kingdom, Apr. 30, 1976, 17724/76
Int. Cl.[2] C21C 5/30
U.S. Cl. 75—60 16 Claims



1. A method for refining molten metal containing an impurity which is oxidisable in preference to at least one selected constituent element of the metal and which forms a gaseous oxide, the method comprising injecting oxygen and a diluent gas into the molten metal contained in a vessel so as to reduce the proportion of the impurity in the metal by evolution as the gaseous oxide, weighing the vessel during the refining to establish a point at which the weight of the vessel contents changes significantly due to the preferential oxidation of the at least one selected constituent element, initiating at the point a reduction in the ratio of oxygen: diluent gas so as to reduce the rate of oxidation of the at least one selected constituent element relative to the impurity and continuing injection until the proportion of the impurity is reduced to the desired level.

4,113,470
PROCESS FOR SUSPENSION SMELTING OF FINELY-DIVIDED SULFIDIC AND/OR OXIDIC ORES OR CONCENTRATES

Olavi August Aaltonen, Pori, and Jyrki Tapani Juusela, Harjavalta, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Continuation-in-part of Ser. No. 592,332, Jul. 1, 1975, abandoned. This application Jan. 8, 1976, Ser. No. 647,506
Claims priority, application Finland, Jul. 5, 1975, 2088/74
Int. Cl.[2] C22B 15/02
U.S. Cl. 75—74 2 Claims

1. A process for the suspension smelting of finely divided raw material selected from sulfide and oxide ores and concentrates comprising the steps of:

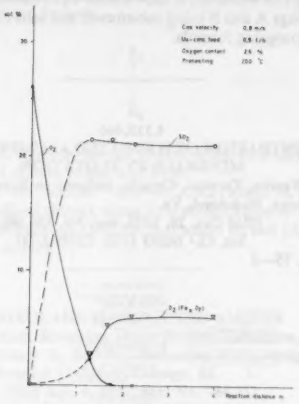
(a) feeding a flow of said finely divided raw material into a suspension reaction zone along with pre-heated oxygen containing gas at a point about 2 to 6 meters above the surface of an accumulated melt in said suspension reaction zone;

(b) causing said finely divided material to pass downwards through said suspension reaction zone as particles in suspension in said pre-heated oxygen containing gas and raising the heat content of said particles while controlling suspension flow velocity to cause an average delay period of said suspension in the suspension reaction zone of about 0.5 to 2 seconds;

(c) oxidizing and partially melting the finely divided material in said suspension in said reaction zone to produce an oxidized suspension;

(d) then causing said oxidized suspension to flow sidewards perpendicularly to its original flow direction, causing most of said particles with their increased heat content to impinge against a surface of said accumulated melt in said reaction zone; and

(e) then directing the residual oxidized suspension remaining after the impingement of step (d) to flow into a rising zone and separating solids from said residual suspension;



all of the heat required for said smelting process being supplied to the particles falling downward in suspension in said reaction zone during step (b).

4,113,471
EXTRACTION OF NON-FERROUS METAL VALUES FROM DOLOMITIC OXIDE ORES

Martin A. Langhorst; Gerard C. Sinke, both of Midland, and Elmer H. Mossner, Saginaw, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 2, 1976, Ser. No. 746,981
Int. Cl.[2] C22B 3/00
U.S. Cl. 75—101 R 11 Claims

1. A process for extracting values of non-ferrous metals selected from the group consisting of silver, copper, lead, zinc, gold, nickel, magnesium, and chromium from a dolomitic oxide ore comprising:

leaching the ore with an aqueous solution consisting essentially of at least one metal chloride salt selected from the group consisting of alkali metal chlorides and alkaline earth chlorides in the presence of an oxygen-containing gas at a temperature of from about 125° C to about 225° C at a pressure of from about 200 to about 600 pounds per square inch gauge to solubilize the non-ferrous metal values into the aqueous solution of the metal chloride salt.

10. The process of claim 1 including the subsequent step of recovering solubilized elemental non-ferrous metal values from the metal chloride salt solution.

4,113,472
HIGH STRENGTH ALUMINUM EXTRUSION ALLOY

Julius C. Fister, Jr., Hamden; John F. Breedis, Trumbull, and Michael J. Pryor, Woodbridge, all of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 4, 1977, Ser. No. 784,155
Int. Cl.[2] C22C 21/16
U.S. Cl. 75—142 14 Claims

1. An aluminum base alloy of high strength properties having improved weldability, consisting essentially of 0.9–1.5% magnesium, 0.4–0.8% silicon, 0.9–1.5% copper, and from 0.05 to 0.4% of at least one member of the group of elements consisting of manganese, iron, and chromium, up to 0.2% each of zirconium, vanadium, and titanium, up to 0.4% cobalt, and up to 3.5% nickel, and balance aluminum, wherein the copper

content does not exceed the sum of the magnesium plus silicon contents and the silicon content does not exceed the sum of 0.58 × magnesium content plus 0.25 × the sum of the manganese and iron contents, said alloy having substantially equal contents of magnesium and of copper.

4,113,473

PROCESS FOR OBTAINING NOVEL BLANKS FOR EXTRUSION BY IMPACT

Robert Gauvry, Paris, and Robert Portalier, Ville D'Avray, both of France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Mar. 16, 1977, Ser. No. 778,233
Claims priority, application France, Mar. 19, 1976, 76 08611
Int. Cl.² C22C *1/06*
U.S. Cl. 75—148 **5 Claims**

1. A process for obtaining homogeneous and isotropic cast blanks for impact extrusion of silicon-aluminum alloys containing more than 12% of silicon comprising the steps of

providing a liquid aluminum alloy with more than 12% of silicon,

refining said alloy by adding from 0.01% to 0.1% of phosphorus,

casting said alloy in a mold having a high thermal conductivity,

cooling the mold from the base,

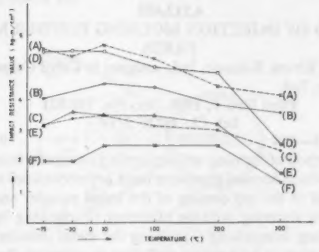
applying, once solidification has begun, a pressure in the range of 0.1 to 5 bars.

4,113,474

COPPER ALLOYS OF EXCELLENT CORROSION RESISTANCE, MOLDABILITY AND WORKABILITY

Masao Okano, Suwa, Japan, assignor to Toyo Valve Company, Ltd., Tokyo, Japan

Filed Jun. 23, 1976, Ser. No. 698,800
Claims priority, application Japan, Sep. 12, 1974, 49-105233
Int. Cl.² C22C *9/04*
U.S. Cl. 75—156.5 **3 Claims**



1. A copper alloy which is composed of 27.0–32.0 wt % zinc, 0.8–4.0 wt % lead, 0.2–0.8 wt % silicon, 0.1–2.0 wt % manganese, 0.01–0.1 wt % arsenic, 0.03–0.4 wt % aluminum, 0.01–1.0 wt % tin, the remainder being copper.

4,113,475

TARNISH RESISTANT COPPER ALLOY

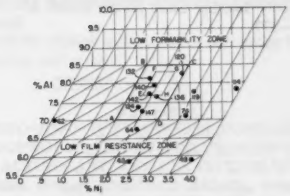
Richard D. Smith, Acton, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 675,604, Apr. 9, 1976, abandoned. This application Feb. 17, 1977, Ser. No. 769,723
Int. Cl.² C22C *9/01*
U.S. Cl. 75—159 **8 Claims**

1. A tarnish resistant wrought copper alloy consisting essentially of the following constituents in the following amounts in percent by weight:

Aluminum	7.0 – 8.5
Nickel	1.5 – 2.5
Copper	89.0 – 91.5

and having a film resistance of at least 95 kilohms which is a measure of the alloys tarnish resistance and a microstructure



containing less than 2 volume percent of intermetallic β and γ phases said alloy having the following minimum properties in the annealed condition, yield strength of 46,000 psi, tensile strength of 85,000 psi, elongation of 38.5%, limiting draw ratio of 2.12 and Olsen Bulge Height of 0.413 inches.

4,113,476

METHOD OF TREATING LOW ANTIMONY ALLOY BATTERY GRID MATERIAL WITH PHOSPHORUS

John Nees, Wyomissing, and Kenneth Pike, Reading, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Filed Oct. 20, 1976, Ser. No. 734,311
The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.
Int. Cl.² C22C *11/00*
U.S. Cl. 75—166 C **4 Claims**

1. A method of treating a low-antimony battery grid lead alloy prior to casting comprising the steps of:

(a) bringing said alloy into a molten state; and

(b) adding between 0.001 to 0.010 wt-% of phosphorus to said molten alloy,

said alloy comprising between 2.25 and 2.75% antimony, between 0.25 and 0.50 wt-% tin, between 0.04 and 0.06 wt-% copper, between 0.003 and 0.01 wt-% sulfur, and a maximum of 0.15% arsenic.

4,113,477

METHOD OF TREATING LOW ANTIMONY ALLOY BATTERY GRID MATERIAL WITH PHOSPHORUS

John Nees, Wyomissing, and Kenneth Pike, Reading, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 734,311, Oct. 20, 1976. This application Feb. 16, 1977, Ser. No. 768,960
The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.
Int. Cl.² C22C *11/00*
U.S. Cl. 75—166 C **6 Claims**

1. A method of treating a low-antimony battery grid lead alloy prior to casing comprising the steps of:

(a) bringing said alloy into a molten state; and

(b) adding between 0.001 to 0.010 wt-% of phosphorus to said molten alloy,

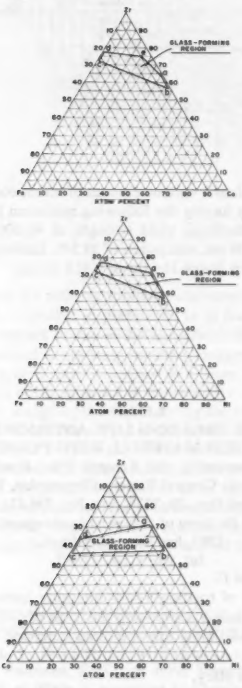
said alloy comprising between 2.25 and 2.75% antimony.

4,113,478

ZIRCONIUM ALLOYS CONTAINING TRANSITION METAL ELEMENTS

Lee E. Tanner, Summit, and Ranjan Ray, Morristown, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Aug. 9, 1977, Ser. No. 823,080
Int. Cl.[2] C22C *16/00, 30/00*
U.S. Cl. 75—177 6 Claims



1. A primarily glassy zirconium-base alloy containing at least two transition metal elements selected from the group consisting of iron, cobalt and nickel, said alloy consisting essentially of a composition selected from the group consisting of

(a) zirconium, iron and cobalt which, when plotted on a ternary composition diagram in atom percent Zr, atom percent Fe and atom percent Co, is represented by a polygon having at its corners the point defined by
(1) 64 Zr — 1 Fe — 35 Co
(2) 56 Zr — 1 Fe — 43 Co
(3) 72 Zr — 27 Fe — 1 Co
(4) 77 Zr — 22 Fe — 1 Co
(5) 75 Zr — 5 Fe — 20 Co;

(b) zirconium, iron and nickel which, when plotted on a ternary composition diagram in atom percent Zr, atom percent Fe and atom percent Ni, is represented by a polygon having at its corners the points defined by
(1) 71 Zr — 1 Fe — 28 Ni
(2) 57 Zr — 1 Fe — 42 Ni
(3) 72 Zr — 27 Fe — 1 Ni
(4) 77 Zr — 22 Fe — 1 Ni; and

(c) zirconium, cobalt and nickel which, when plotted on a ternary composition diagram in atom percent Zr, atom percent Co, and atom percent Ni, is represented by a polygon having at its corners the points defined by
(1) 71 Zr — 1 Co — 28 Ni
(2) 57 Zr — 1 Co — 42 Ni
(3) 56 Zr — 43 Co — 1 Ni
(4) 64 Zr — 35 Co — 1 Ni.

4,113,479

VACUUM SMELTING PROCESS FOR PRODUCING FERROTUNGSTEN

Donald O. Buker, Lakewood, Colo., assignor to AMAX Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 661,978, Feb. 27, 1976, Pat. No. 4,039,325, which is a continuation-in-part of Ser. No. 508,848, Sep. 24, 1974, Pat. No. 3,966,459. This application Feb. 14, 1977, Ser. No. 768,386
Int. Cl.[2] C22C *38/22*
U.S. Cl. 75—211 14 Claims

1. A process for producing a ferrotungsten alloy which comprises the steps of forming a substantially uniform particulated mixture comprised of a finely-particulated tungsten containing mineral concentrate selected from the group consisting of wolframite, ferberite, huebnerite, scheelite and mixtures thereof; a finely-particulated iron-bearing material present in an amount to adjust the iron content in the resultant ferrotungsten alloy to the desired concentration, and a finely-particulated carbonaceous reducing agent present in an amount slightly in excess of the stoichiometric quantity required to reduce the tungsten oxide compounds and any iron oxide compounds present to the metallic state, agglomerating said mixture into a plurality of shape-retaining pellets, heating said pellets to an elevated temperature above about 2500° F while under a pressure of less than about 0.5 Torr for a period of time sufficient to effect a reduction of substantially all of the tungsten oxide compounds and any iron oxide compounds present to the metallic state and an alloying of the reduced metallic tungsten and iron to form a ferrotungsten alloy and to volatilize the contaminating constituents in said pellets, continuously withdrawing the gaseous volatilized contaminating constituents and gaseous reaction products of the oxidized said reducing agent, and thereafter cooling and extracting the substantially dense sintered ferrotungsten alloy pellets.

4,113,480

METHOD OF INJECTION MOLDING POWDER METAL PARTS

Ronald D. Rivers, Kokomo, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed Dec. 9, 1976, Ser. No. 748,821
Int. Cl.[2] B22F *3/14*
U.S. Cl. 75—214 9 Claims

1. A method of forming self-supporting compacts from metal powder, which formed compacts have green densities substantially equal to the tap density of the metal powder and being adapted for sintering without blistering or cracking by injection molding, comprising (1) mixing the metal powder with a plastic medium in an amount sufficient to substantially fill the entire void volume of the metal powder, thereby forming a plastic mixture, the plastic medium comprising an organic binder dissolved in a solvent in which it is soluble at room temperature but in which it is substantially less soluble at a higher temperature such that the plastic medium increases in viscosity at higher temperatures by rejection of the solvent, (2) injecting the plastic mixture under pressure at room temperature into a closed die preheated to that higher temperature, whereby solvent is rejected from the mixture and the rejection of solvent and increase in viscosity of the plastic medium produces a compact sufficiently self-supporting to hold its molded shape and to be ejected from a die cavity (3) removing the compact from which solvent has been rejected from the die and (4) drying the ejected compact to remove the remaining solvent therefrom and leave interconnecting pores in the compact for the escape of gases resulting from subsequent burning out of the binder during the sintering operation.

4,113,481

GREEN BALLS FORMED BY AGGLOMERATING WET-COLLECTED FUME PRODUCED IN METALLURGICAL FURNACES

John W. Kreiger, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Division of Ser. No. 592,287, Jul. 1, 1975, Pat. No. 4,004,916. This application Oct. 18, 1976, Ser. No. 734,771
Int. Cl.[2] C22C *33/02, 39/54*
U.S. Cl. 75—256 2 Claims

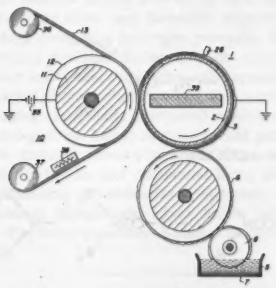
1. Green balls suitable for charging into steelmaking furnaces and derived from particles of fume formed in steelmaking furnaces, said fume comprising at least one fume taken from the group consisting of wet-collected fume and dry collected water leached fume and mixtures thereof, said particles of fume being spray-dried to substantially instantaneously dry the fume, impacted in a one-point impact step to fracture any spheroids formed during spray-drying whereby new fracture surfaces are formed, and the Blaine surface area of said fume is increased to more than 8000 square centimeters per gram and balled on a balling device whereon moisture required for balling is added to the fume, said green balls consisting of water and said particles of fume and being characterized by having a moisture content of 7 to 12% by weight, a moist compression strength of not less than 15 pounds, and moist strength sufficient to resist breakage when dropped at least 10 times from a height of about eighteen inches onto a steel plate.

4,113,482

MIGRATION IMAGING METHOD INVOLVING COLOR CHANGE

John B. Wells, Savannah, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 651,301, Jan. 22, 1976, abandoned, which is a division of Ser. No. 406,056, Oct. 12, 1973, which is a continuation-in-part of Ser. No. 199,683, Nov. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 863,507, Oct. 3, 1969, abandoned. This application Oct. 26, 1976, Ser. No. 735,344
Int. Cl.[2] G03Q *13/22*
U.S. Cl. 96—1 PS 1 Claim



1. A migration imaging method comprising the steps of:
(a) providing a substrate having a layer of softenable material thereon, said softenable material being in contact with migration material, the migration material comprising an imaging composition which comprises at least two differently colored pigment particles dispersed and bound in a polymeric matrix, said particles comprising cyan, magenta, and yellow pigments, at least one of said particles or said matrix being electrically photoresponsive, said imaging compositions exhibiting the resultant color of the differently colored pigments and being capable of forming images in said resulting color without color or particle separation;
(b) subjecting said migration material to a migration force in image configuration;
(c) softening said softenable material whereby said migration material migrates in depth through said softenable material in imagewise configuration to said substrate to form an image;
(d) removing the softenable material and unmigrated material, and;
(e) selectively changing the color of said image by means of disrupting said matrix.

4,113,483

PHOTOSENSITIVE MATERIAL CONTAINING DI-IODOPROPYL CELLULOSE, PROCESS FOR ITS MANUFACTURE AND THE USE OF THIS MATERIAL

Alain Roman, Bossey; Jean-Pierre Sachetto, Saint-Julien en Genevois, both of France; Manfred Wust, Dardagny, and Jean Koutroulos, Carouge, both of Switzerland, assignors to Neste Oy, Finland

Filed Feb. 14, 1977, Ser. No. 768,494
Int. Cl.[2] G03G *0/00;* G03C *1/00, 5/24*
U.S. Cl. 96—1 PC 20 Claims

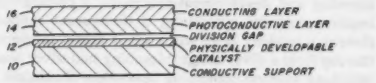
1. Photosensitive material comprising a substrate at least one surface portion of which contains uniformly distributed diiodopropyl cellulose.

4,113,484

ELECTROPHOTOGRAPHIC ELEMENTS AND PROCESSES

Mark Lelental, Penfield, and William Andrew Light, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 12, 1977, Ser. No. 824,136
Int. Cl.[2] G03G *15/24*
U.S. Cl. 96—1 R 19 Claims



1. A photographic element comprising:
(1) a non-catalytic conductive support;
(2) a substantially uniform first layer coated on said support, said layer comprising a physically developable catalyst having a coverage of 1×10^{-6} to 1×10^{-10} g/cm^2 of support;
(3) a photoconductive second layer separated from said first layer by an air gap of up to 20 microns; and
(4) a conductive layer over said second layer
wherein at least said conductive support (1) or said conductive layer (4) is transparent to the electromagnetic radiation to which said photoconductive second layer (3) is sensitive.

11. A process of preparing an image in an element comprising a conductive support having coated thereon a substantially uniform first layer comprising a physically developable catalyst having a coverage of 1×10^{-6} to 1×10^{-10} g/cm^2 and a second photoconductive layer separated from said first layer by an air gap of up to 20 microns, said process comprising the steps of:
(1) applying a voltage across said element of at least about 1×10^5 volts/cm up to the dielectric breakdown potential of said layers;
(2) imagewise destroying the developability of said catalyst by imagewise exposing said second layer to electromagnetic radiation while said voltage is being applied so as to subject the image areas of said first layer to a charge exposure greater than 1×10^{-8} coulombs/cm^2; and
(3) developing said first layer by physical development.

4,113,485
PROCESS FOR MAKING PHOTO-MECHANICAL DROP-OUT MASK

Vincent M. Maselli, 8909 McVicker Ave., Morton Grove, Ill. 60053

Filed Jun. 2, 1977, Ser. No. 802,798
Int. Cl.² G03C *7/04, 7/16, 5/06*
U.S. Cl. 96—5 **7 Claims**

1. A method of making a photo-mechanical drop-out mask to be used with a principal photograph taken of an object, which principal photograph was made by exposing a first portion of a given film in a camera positioned at a given location, said method comprising the steps of:

illuminating the object with substantially only a back illumination so as to silhouette the object;

while the object is so illuminated, taking a second photograph of the object using said camera at said location and using a second portion of said given film in said camera to produce a silhouette of the object on the second portion of the film;

processing both of said portions of said film under identical conditions to develop the film; and

exposing a high-contrast film to the developed second portion of the film to produce a negative of said silhouette on said high-contrast film from said second portion which constitutes the said drop-out mask.

4,113,486
METHOD FOR PRODUCING A PHOTOMASK

Masamichi Sato, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Continuation of Ser. No. 517,285, Oct. 22, 1974, abandoned.
This application Jun. 9, 1976, Ser. No. 694,423
Claims priority, application Japan, Oct. 22, 1973, 48-118692
Int. Cl.² G03C *5/32;* **C23F** *1/00;* **G03B** *27/00;* **G03C** *11/00*
U.S. Cl. 96—36 **25 Claims**

1. A method for producing a photo mask, which comprises exposing and development-processing a photographic light-sensitive material comprising a transparent support having thereon a masking layer and a silver halide emulsion layer to thereby form a silver image, bleaching said silver image with a bleaching solution containing hexavalent chromium ion, heating in the presence of oxygen to imagewise uncover the masking layer, etching away the uncovered masking layer, and then removing the emulsion layer at the non-image areas to uncover the masking layer corresponding to the non-image areas.

4,113,487
METHOD FOR MANUFACTURE OF EXPANDED ARTICLES HAVING AN EMBOSSED SURFACE

Kazuo Matsunaga, Fussa; Hideo Ishizawa, Tokyo, and Kenichi Kurata, Yokohama, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1976, Ser. No. 735,523
Claims priority, application Japan, Oct. 31, 1975, 50-131260; Mar. 26, 1976, 51-33167; Apr. 21, 1976, 51-46025; May 12, 1976, 51-53972; Jun. 24, 1976, 51-74652
Int. Cl.² G03C *5/00, 11/00*
U.S. Cl. 96—38.1 **16 Claims**

1. A method for the manufacture of interior covering materials comprising the steps of providing a layer of a photo-setting and expandable resin composition containing a blowing agent, a photosensitizer and a reactive plasticizer, applying a colored design on the surface of said layer of resin composition with a light-screening substance, exposing the surface of said layer of resin composition to light to cause the reactive plasticizer contained in the layer not applied by the colored design to polymerize thereby causing the resin composition whose surface is not applied by the colored design to have a higher melt viscosity than the resin composition whose surface is applied by the colored design, and then heating said layer of resin composition to expand the colored design-applied portions of said layer of resin composition to form an embossed design registered to a colored design.

4,113,488
METHOD FOR IMPROVING THE LIGHT FASTNESS OF COLOR PHOTOGRAPHIC DYE IMAGES

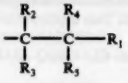
Minoru Yamada; Tadao Shishido, and Atsuaki Arai, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 13, 1976, Ser. No. 686,201
Claims priority, application Japan, May 13, 1975, 50/56973
Int. Cl.² G03C *7/00, 1/40*
U.S. Cl. 96—56 **24 Claims**

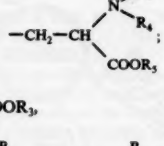
1. A method for improving the light fastness of a magenta color image in a silver halide color photograph which comprises incorporating into a layer containing a magenta color image, which is formed upon reaction of a magenta coupler and an oxidation product of an aromatic primary amine color developing agent, at least one light fastness improving phenolic compound selected from the group consisting of a phenol derivative in which at least one of the ortho positions to the hydroxy group thereof is substituted with a tertiary alkyl group, a bisphenol derivative, a phosphoric acid ester of a phenol derivative, a halophenol or a phenol derivative in which the para position to the hydroxy group is substituted with an oxygen atom and a 5- or 6-membered ring formed together with the oxygen atom is fused to the phenol nucleus of the phenol derivative and at least one synergistic light fastness improving agent selected from a sulfide or sulfoxide compound represented by the following General Formula (V):

$$X—B—Y \qquad (V)$$

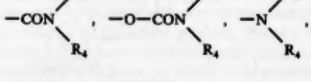
wherein B represents —S— or —SO—; X and Y, which may be the same or different, each represents $—(CH_2)_n—R_1$,



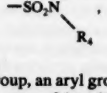
or



R_1 represents $—COOR_3$,



$—OR_6$, $—O—COR_6$, $—NHSO_2R_6$,



$—NHCOR_6$, a cyano group, an aryl group or a hydroxy group; R_2 represents an alkyl group of 1 to 30 carbon atoms, an aryl group, an aralkyl group, a hydroxy group, a cyano group or $—COOR_3$; R_3, R_4, R_5 and R_6 each represents a hydrogen atom, an alkyl group of 1 to 30 carbon atoms, an aryl group or an aralkyl group with the proviso that R_6 is not a hydrogen atom; and n is an integer of 1 to 4.

4,113,489
METHOD OF FORMING PHOTOGRAPHIC LINE AND HALF-TONE IMAGES

Mitsunori Sugiyama; Shoji Ishiguro; Nobuo Sugiyama; Yoo Iijima; Eiichi Okutsu; Haruhiko Iwano, all of Minami-ashigara; Katsumi Hosoya, and Hikoharu Hara, both of Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 1, 1972, Ser. No. 231,001
Int. Cl.[2] G03C *5/32, 5/38*
U.S. Cl. 96—60 R **18 Claims**

1. A method for forming a high-contrast silver halide photographic image, which comprises developing an exposed high-contrast silver halide photographic element containing at least 50 mol percent silver chloride with a developer containing:

(1) at least one dihydroxybenzene compound, and

(2) a sulfite ion, said sulfite ion being present in a concentration of 5 grams or less per liter of said developer, fixing said photographic element after developing and before or during fixation treating said developed photographic element with a solution containing a halide and an oxidizing agent selected from the group consisting of a bichromate, a ferricyanide, a persulfate and a perchlorate, or a solution containing a ferric ion chelate complex salt oxidizing agent.

4,113,490
METHOD FOR PROCESSING LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Mitsuto Fujiwhara; Syunji Matsuo; Toyoaki Masukawa; Mikio Kawasaki, and Yutaka Kaneko, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi-Muro, Japan

Continuation of Ser. No. 594,492, Jul. 9, 1975, abandoned. This application Jul. 8, 1977, Ser. No. 814,121
Claims priority, application Japan, Jul. 12, 1974, 49-80321; Sep. 21, 1974, 49-109213
Int. Cl.[2] G03C *5/32, 5/38, 5/50, 7/16*
U.S. Cl. 96—60 R **9 Claims**

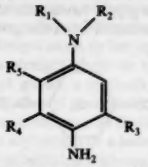
1. In a method for processing an imagewise exposed light-sensitive silver halide photographic material containing a coupler, which method comprises developing said silver halide photographic material with a developing bath for imagewise forming a catalytic silver and thereafter amplifying with an amplifying bath containing hydrogen peroxide, the improvement comprising treating, during said developing or after developing but before said amplifying, said exposed light-sensitive silver halide photographic material with a primary amine color developing agent and a compound capable of adsorbing on or dissolving silver halide at the exposed portion of the photographic material, thereby to effect deactivation of said unexposed silver halide, said compound being selected from the group consisting of mercapto compounds, azole compounds, oxonium compounds, silver halide solvents, benzyladenine, 8-hydroxyquinoline, o-phenanthroline, thiosugar and dyes.

4,113,491
COLOR PHOTOGRAPHIC DEVELOPING COMPOSITION

Hidetaka Deguchi; Shoji Kikuchi; Hajime Wada; Shui Satoh, and Takaya Endo, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi-muro, Japan

Filed Feb. 6, 1976, Ser. No. 656,084
Claims priority, application Japan, Feb. 10, 1975, 50-17246; Dec. 22, 1975, 50-153567
Int. Cl.[2] G03C *5/30, 7/16*
U.S. Cl. 96—66 R **1 Claim**

1. An aqueous, alkaline color photographic developing solution comprising as a color developing agent a compound, or its salt, represented by the general formula:

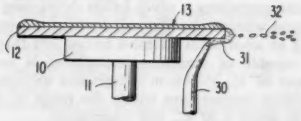


wherein R_1 is $—(R_7O)_{n_1}—(R_8O)_{n_2}—R_9$ wherein R_7 and R_8 are individually a substituted or unsubstituted alkylene group having 1 to 6 carbon atoms, said substituent being an aralkyl, aryl, alkoxy or halo group, n_1 and n_2 are individually 0 or an integer of 1 or more, the sum of n_1 and n_2 being 3 or more, and R_9 is an alkyl group, an aryl group or an aralkyl group; R_2 is a hydrogen atom, a substituted or unsubstituted alkyl group, said substituent being a hydroxy, amino, alkoxy, acylamido, carbamyl, alkylsulfonamido or aryloxy group or R_1; and R_3, R_4 and R_5 are individually a hydrogen or halogen atom, or a hydroxy, amino, alkoxy, sulfonamido, acylamido or substituted or unsubstituted alkyl group, said substituent being an acylamido or alkylsulfonamido group, provided that the alkyl group represented by each of R_2, R_3, R_4, R_5 and R_9 has 1 to 6 carbon atoms.

4,113,492
SPIN COATING PROCESS

Masamichi Sato, and Itsuo Fujii, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 8, 1977, Ser. No. 785,886
Claims priority, application Japan, Apr. 8, 1976, 51-39690
Int. Cl.[2] B05D *3/12*
U.S. Cl. 96—67 **14 Claims**



1. A process of spin coating a coating composition on a surface of a base plate which comprises projecting material, which is compatible or dissolves the coating composition, in a liquid or vapor form to the opposite surface of the base plate to the surface on which the coating composition has been supplied while rotating the base plate to remove the coating composition flowing to the opposite surface and/or the edge of the base plate.

4,113,493
AMORPHOUS POLYESTER ADHESIVES FOR PHOTOGRAPHIC MATERIALS

Mohammad Akram Sandhu, Webster, and Kenneth Lloyd Tingler, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

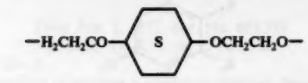
Filed Mar. 17, 1977, Ser. No. 778,635
Int. Cl.[2] G03C *1/76*
U.S. Cl. 96—67 **36 Claims**

1. In a radiation-sensitive element comprising a support and having thereon at least one radiation-sensitive layer, the improvement wherein the element contains at least one layer containing an amorphous polyester adhesive having less than 1% crystallinity, capable of remaining amorphous at temperatures above about 20° C., soluble in halogenated solvents, having a glass transition temperature within the range of from about −30° C. to about +50° C., and comprising:

(a) an acid component comprising at least one phthalic acid derivative and

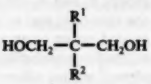
(b) a glycol component comprising:

(i) from about 15 to about 85 mole percent of at least one linear aliphatic glycol having the structure HO—R—H wherein R is selected from the group consisting of:



and $[CH_2CH_2O]_n$ wherein n is an integer of from 2 to 4; and

(ii) from about 85 to about 15 mole percent of at least one branched aliphatic glycol having the structure:



wherein R^1 and R^2 are alkyl.

34. In a photographic film unit comprising:

(a) a photosensitive element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material;

(b) a dye image-receiving layer;

(c) means for discharging an alkaline processing composition within the film unit;

(d) a neutralizing layer for neutralizing the alkaline processing composition;

(e) a spacer rail substrate; and

(f) a barrier timing layer located between the spacer rail substrate and the neutralizing layer and which is permeable by the alkaline processing composition after a predetermined time;

the film unit containing a silver halide developing agent, the improvement wherein the film unit contains at least one layer containing an amorphous adhesive having less than 1% crystallinity, capable of remaining amorphous at temperatures above about 20° C., soluble in halogenated solvents, having a glass transition temperature within the range of from about −30° C. to about +50° C., and comprising:

(a) an acid component which is terephthalic acid and

(b) a glycol component which comprises:

(i) from about 40 to about 60 mole percent of diethylene glycol and

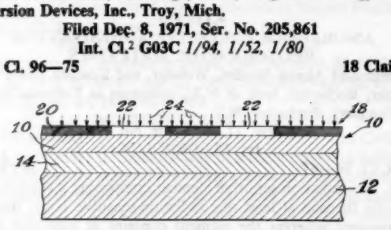
(ii) from about 60 to about 40 mole percent of neopentyl glycol.

4,113,494

STRUCTURE FOR PRODUCING IMAGED STRUCTURES

Robert W. Hallman, San Diego, Calif., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Dec. 8, 1971, Ser. No. 205,861
Int. Cl.² G03C 1/94, 1/52, 1/80
U.S. Cl. 96—75 18 Claims



1. An imaging material comprising: a layer comprising a thin film of an energy sensitive high molecular weight condensation product of a nitrogen containing compound which is soluble in a first solvent and which upon the application of energy thereto is capable of giving off nitrogen thereby becoming insoluble in said first solvent; and a layer comprising a thin film of an image forming material, which is soluble in a second solvent and not soluble in said first solvent, the film of the condensation product and the film of the image forming material and the thinnesses thereof being such that the change in state of the condensation product upon the application of energy thereto and the dissolution by said second solvent of the image forming material in the areas where the condensation product has not undergone a change in state, can, together, take place in substantially less than 1 minute to provide an imaged product.

14. An imaging material comprising: a layer comprising a thin film of an energy sensitive material which is capable of changing upon the application of energy between two states, one of which is a state in which the material is soluble in a first solvent, the other being a state in which the material is not soluble in said first solvent; and a layer comprising as an image forming material a thin film of an opaque tellurium composition which comprises from about 50 atomic percent to 100 atomic percent tellurium and which is soluble in a second solvent, but not soluble in said first solvent, the film of energy sensitive material and the film of the tellurium composition and the thinnesses thereof being such that the change in state of the energy sensitive material upon the application of energy thereto and dissolution by said second solvent of the tellurium composition in the areas where the energy sensitive material has not undergone a change in state, can, together, take place in substantially less than 1 minute to provide an imaged product.

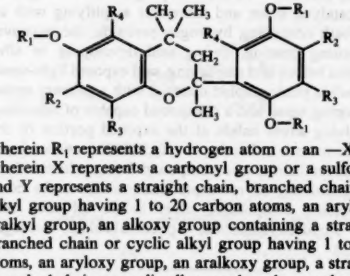
4,113,495

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CAPABLE OF PROVIDING STABLE COLOR IMAGES

Tadao Shishido; Hiroshi Hara, and Atsuaki Arai, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

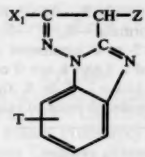
Filed Jun. 13, 1977, Ser. No. 806,121
Claims priority, application Japan, Jun. 11, 1976, 51-69148
Int. Cl.² G03C 1/40, 7/00
U.S. Cl. 96—100 R 16 Claims

1. A color photographic silver halide lightsensitive material containig a coupler therein and, in at least one photographic layer, a compound represented by the following general formula (I):



wherein R_1 represents a hydrogen atom or an —X—Y group wherein X represents a carbonyl group or a sulfonyl group, and Y represents a straight chain, branched chain or cyclic alkyl group having 1 to 20 carbon atoms, an aryl group, an aralkyl group, an alkoxy group containing a straight chain, branched chain or cyclic alkyl group having 1 to 20 carbon atoms, an aryloxy group, an aralkoxy group, a straight chain, branched chain or cyclic alkoxycarbonyl group having 2 to 20 carbon atoms, an aryloxycarbonyl group, or an aralkoxycarbonyl group; and R_2, R_3 and R_4, which may be the same or different, each represents a hydrogen atom, a straight chain, branched chain or cyclic alkyl group having 1 to 20 carbon atoms, a straight chain, branched chain or cyclic alkoxy group having 1 to 20 carbon atoms, an aryl group, an aryloxy group, an aralkyl group, an aralkoxy group, an alkenyl group, an alkenoxy group, an acylamino group, a halogen atom, an alkylthio group containing a straight chain, branched chain or cyclic alkyl group having 1 to 20 carbon atoms, an aryl group, a diacylamino group, an acyl group having 1 to 20 carbon atoms, a sulfonamido group, a straight chain, branched chain or cyclic alkylamino group having 1 to 20 carbon atoms, a straight chain, branched chain or cyclic alkoxycarbonyl group

having 2 to 20 carbon atom or an acyloxy group having 1 to 20 carbon atoms, provided that R_2, R_3 and R_4 do not simultaneously represent hydrogen atoms, wherein said coupler is a magenta coupler represented by the general formula (II) or (III);



wherein W represents a hydrogen atom or has up to 35 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, or a cycloalkenyl group, which groups may be substituted with one or more substituents selected from the group consisting of a hydrogen atom, a nitro group, a cyano group, a monoaryl group, an alkoxy group, a monoaryloxy group, a carboxy group, an alkylcarbonyl group, a monoarylcarbonyl group, an alkoxycarbonyl group, a monoaryloxycarbonyl group, a sulfo group, an acyloxy group, a sulfamoyl group, a carbamoyl group, an acylamino group, a imido group, a ureido group, a thioureido group, a urethane group, a thiourethane group, a sulfonamido group, a heterocyclic group, an arylsulfonyloxy group, an alkylsulfonyloxy group, an arylsulfonyl group, an alkylsulfonyl group, an arylthio group, an alkylthio group, an alkylsulfinyl group, an arylsulfinyl group, an alkylamino group, a dialkylamino group, an anilino group, an N-arylanilino group, an N-alkylanilino group, an N-acylanilino group, a hydroxy group and mercapto group; an aryl group and an aryl group having 1 to 5 substituents selected from the group consisting of a halogen atom, an alkyl group, an alkenyl group, a monocycloalkyl group, an aralkyl group, a monocycloalkenyl group, a nitro group, a cyano group, a mono- or polycyclic aryl group, an alkoxy group, a mono- or polycyclic aryloxy group, a carboxy group, an alkylcarbonyl group, an arylcarbonyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a sulfo group, an acyloxy group, a sulfamoyl group, a carbamoyl group, an acylamino group, an imido group, a ureido group, a thioureido group, a urethane group, a thiourethane group, a sulfonamido group, a heterocyclic group, an arylsulfonyloxy group, an alkylsulponyloxy group, an arylsulfonyl group, an alkylsulfonyl group, an arylthio group, an alkylthio group, an alkylsulfinyl group, an arylsulfinyl group, an alkylamino group, a dialkylamino group, an anilino group, an N-alkylanilino group, an N-arylanilino group, an N-acylanilino group, a hydroxy group and a mercapto group; a heterocyclic group or a heterocyclic group substituted with one or more substituents above described for the aryl group for W; an acyl group a thioacyl group; an alkylsulfonyl arylsulfonyl group; an alkylsulfinyl group; an arylsulfinyl group; a carbamoyl group; or a thiocarbamoyl group;

X_1 represents a hydrogen atom or has up to 35 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group and a cycloalkenyl group, which groups may be substituted with one or more substituents as described above for these groups for W; an aryl group or a heterocyclic group, each of which can be substituted with one or more substituents as described above the aryl group and the heterocyclic group for W; an alkoxycarbonyl group; an aryloxycarbonyl group; an aralkyloxycarbonyl group; an alkoxy group; an aryloxy group; an arylthio group; a carboxy group; an acylamino group; an imido group; an N-alkylacylamino group; an N-arylacylamino group; a ureido group; a thioureido group; a urethane group; a thiourethane group; an anilino group; an alkylamino group; a cycloamino group; an alkylcarbonyl group; an arylcarbonyl group; a sulfonamido group; a carbamoyl group; a sulfamoyl group; a guanidino group; a cyano group; an acyloxy group; a sulfonyloxy group; a hydroxy group; a mercapto group; a halogen atom; or sulfo group;

T represents a hydrogen atom or has up to 35 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, and a cycloalkenyl group which may be substituted with one or more substituents as described above for these groups for W; an aryl group or a heterocyclic group, each of which may be substituted with one or more substituents as described above for the aryl group and the heterocyclic group for W; a halogen atom; a cyano group; an alkoxy group; an aryloxy group; a carboxy group; an alkoxycarbonyl group; an aryloxycarbonyl group; an acyloxy group; an alkylcarbonyl group; an arylcarbonyl group; an alkylthiocarbonyl group; a sulfo group; a salfamoyl group; a carbamoyl group; an arylthiocarbonyl group; an acylamino group; an imido group; a ureido group; a thioureido group; a urethane group; a thiourethane group; a sulfonamido group; an alkylsulfonyloxy group; an arylsulfonyloxy group; an arylsulfonyl group; an alkylsulfonyl group; an arylthio group; an alkylthio group; an alkylsulfinyl group; an arylsulfinyl group; an alkylamino group; a dialkylamino group; an anilino group; an N-arylanilino group; an N-alkylanilino group; an N-acylanilino group; a hydroxy group; or a mercapto group; and

Z represents a hydrogen atom or a coupling-off group bonded to the coupling position through an oxygen atom, a nitrogen atom or a sulfur atom.

4,113,496

DRY IMAGE FORMING MATERIAL

Tetsuo Shiga; Masaru Ozaki; Tatsumi Arakawa, and Hidehiko Kobayashi, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

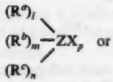
Filed Dec. 16, 1976, Ser. No. 751,778

Claims priority, application Japan, Dec. 16, 1975, 50-149054; Feb. 19, 1976, 51-16528

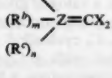
Int. Cl.[2] G03C *1/02, 3/00, 5/24, 1/76*

U.S. Cl. 96—114.1 **12 Claims**

1. A heat-activatable dry image forming material comprising a) and organic silver salt oxidizing agent, b) a reducing agent, and c) a component adapted by heating to interact with the silver ion of (a) to form a photosensitive interaction product, said component consisting essentially of (i) a compound or (ii) a composition which comprises a halogen atom and an organic compound containing at least one element selected from the group consisting of germanium, tin, lead, phosphorus, arsenic, antimony, bismuth, selenium, tellurium and polonium, said compound (i) having the formula



(I)

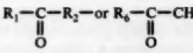


(II)

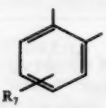
wherein R^a, R^b and R^c each independently is (1) a C_1–C_{22} alkyl group, (2) a C_1–C_{22} alkyl group substituted with a carboxyl group, a cyano group, a halogen atom, an aryl group, a hydroxyl group, an amino group, or a mono- or di-(C_1–C_5 alkyl-)amino group (3) a C_5–C_6 cycloalkyl group, (4) a C_5–C_6 cycloalkyl group substituted with a C_1–C_5 alkyl group, a C_1–C_5 alkoxy group, a halogen atom, a hydroxyl group, an amino group, or a mono- or di-(C_1–C_5 alkyl)amino group, (5) an aryl group (6) an aryl group substituted with a C_1–C_5 alkyl group, a C_1–C_5 alkoxy group, a halogen atom, a hydroxyl group, an amino group, a mono- or di-(C_1–C_5 alkyl) amino group, (7) a

group of the formula $R_1—R_2—$, (8) a group of the formula $R_1—C\equiv C—$, (9) a group of the formula

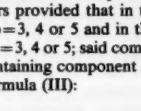
(10) a group of the formula



(11) a group of the formula $R_3—M—$, $(R_3)_2P—$ or $(R_3)_3M—$, (12) a group of the formula $—R_4—$, $—R_5—Y—R_5—$ or $—R_5—R_5—$ which forms 5- or 6- membered ring with Z, wherein R_1 is a hydroxyl group, a C_1–C_5 alkoxy group, an unsubstituted or substituted 5- or 6- membered heterocyclic group having 16 or less carbon atoms and containing in its ring at least one of oxygen and nitrogen, or a group defined in (1) to (7) above; R_2 is a C_1–C_4 alkylene group; R_3 is a group as defined in (1) to (7) above; R_4 is a C_4–C_5 alkylene group unsubstituted or substituted with a C_1–C_5 alkyl group, a C_1–C_5 alkoxy group, a mono- or di-(C_1–C_5 alkyl)amino group, an amino group or a hydroxyl group; R_5 is an ethylene group unsubstituted or substituted with a C_1–C_5 alkyl group, a C_1–C_5 alkoxy group, a mono- or di-(C_1–C_5 alkyl)amino group, an amino group or a hydroxyl group, or a group of the formula



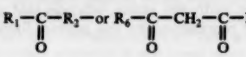
wherein R_7 is hydrogen, a C_1–C_5 alkyl group, a C_1–C_5 alkoxy group, a mono- or di-(C_1–C_5 alkyl)amino group, an amino group, a hydroxyl group or a halogen atom; M is tellurium, germanium, tin, lead or silicon; P is phosphorus; Y is oxygen, nitrogen, sulfur, M or $=MX_2$; and R_6 is a C_1–C_5 alkyl group; X is chlorine, bromine, or iodine; Z is germanium, tin, lead, phosphorus, arsenic, antimony, bismuth, selenium, tellurium or polonium; and m and n are 0 or a positive integer, and l and p are positive integers provided that in the general formula (I) above, $l+m+n+p=3$, 4 or 5 and in the general formula (II) above, $l+m+n+2=3$, 4 or 5; said composition (ii) comprising a halogen atom-containing component and an organic component having the formula (III):



(III)

wherein R^d, R^e, R^f and R^g, each independently is (1) a C_1–C_{22} alkyl group, (2) a C_1–C_{22} alkyl group substituted with a carboxyl group, a cyano group, a halogen group, an aryl group, a hydroxyl group, an amino group, or a mono- or di-(C_1–C_5 alkyl)amino group (3) a C_5–C_6 cycloalkyl group, (4) a C_5–C_6 cycloalkyl group substituted with a C_1–C_5 alkyl group, a C_1–C_5 alkoxyl group, a halogen group, a hydroxyl group, an amino group, or a mono- or di-(C_1–C_5 alkyl)amino group, (5) an aryl group (6) an aryl group substituted with a C_1–C_5 alkyl group, a C_1–C_5 alkoxy group, a halogen group, a hydroxyl group, an amino group, a mono- or di-(C_1–C_5 alkyl) amino group, (7) a group of the formula $R_1—R_2—$, (8) a group of the formula $R_1—C\equiv C—$, (9) a group of the formula

(10) a group of the formula



(11) a group of the formula $R_3—M—$, $(R_3)_2P—$ or $(R_3)_3M—$, (12) a group of the formula $—R_4—$, $—R_5—Y—R_5—$ or $—R_5—R_5—$ which forms 5- or 6- membered ring with Z; and h is a positive integer, and i, j and k are 0 or a positive integer, provided that $h+i+j+k=2$, 3 or 4, there being no silver halide present in the material prior to said heating.

4,113,497

COMPOSITIONS WITH ORGANOHALOGEN COMPOUND AND DIAZONIUM SALTS AS PHOTOINITIATORS OF EPOXY COMPOUNDS IN PHOTO-POLYMERIZATION

Sheldon I. Schlesinger, East Windsor Township, Mercer County, N.J., assignor to American Can Company, Greenwich, Conn.

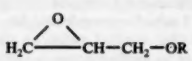
Continuation-in-part of Ser. No. 369,007, Jun. 11, 1973, abandoned. This application Feb. 17, 1976, Ser. No. 658,207

Int. Cl.[2] **G03C** *1/70, 1/54*

U.S. Cl. 96—115 P **6 Claims**

1. A polymerizable composition consisting of:

A monomeric or prepolymeric epoxide material or mixture thereof, said epoxide material being polymerizable to higher molecular weights cationically through the action of a cationic catalyst and being selected from the group consisting of glycidyl ethers of bisphenol A; epoxycycloalkanes; alkylene oxides; monoglycidyl ethers of the formula



wherein R is alkyl or aryl;

epoxy-esters; epoxy phenol or cresol novolacs; epoxy-vinyls; halogenated epoxides and bis(epoxy alkyl) ethers of alkylene glycols and mixtures thereof;

a radiation-sensitive catalyst precursor which decomposes upon exposure to irradiation to provide an active catalyst effective to initiate cationic polymerization of said epoxide material, said precursor being present in an amount by weight equal to from about 1 to about 50% of the epoxide material and being the combination of (1) an organohalogen selected from the group consisting of iodoform, bromoform, carbon tetrabromide and α,α'-dibromoxylene and (2) an amino-aryl diazonium salt of a complex halogenide which releases a Lewis Acid upon exposure to irradiation, the anion of said complex halogenide being selected from the formula $[MX_{n+m}]^{-m}$ wherein M is Fe, Sn, P, As, Sb, B and Bi; X is halogen, m is the net charge on the complex halogenide and n is the oxidation state of M, the relative proportion in said combination being from about 1 to about 6 moles organohalogen per mole of amino-aryl diazonium complex.

4,113,498

CORROSION INHIBITOR FOR METAL SURFACES

Josef Rones; Siegfried Möller, and Helmut Hoch, all of Frankfurt am Main, Fed. Rep. of Germany, assignors to Oxy Metal Industries Corporation, Warren, Mich.

Filed Mar. 28, 1977, Ser. No. 781,820

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614234

Int. Cl.[2] **C09D** *5/08*

U.S. Cl. 106—14.13 **8 Claims**

1. An aqueous composition which, when diluted with water, is suitable for inhibiting corrosion of metallic surfaces, comprising the reaction product of:

(a) at least one aliphatic carboxylic acid having from 6 to 10 carbon atoms;
(b) at least one polyhydroxycarboxylic acid having from 4 to 10 carbon atoms; and
(c) an alkanolamine of an alkanol radical of up to 4 carbon atoms;
wherein the weight ratio of component a : b is from 1 : 0.5 to 1 : 7 and the molar ratio of c : a+b is at least 1.3 : 1.

4,113,499

SUSPENSION FOR MAKING MOLDS IN DISPOSABLE PATTERN CASTING

Valentin Nikolaevich Ivanov, Proletarsky prospekt, 15, kv. 120, and Anna Davydovna Chulkova, Abelmanovskaya ulitsa, 5, kv. 88, both of, Moscow, U.S.S.R.

Filed Mar. 18, 1976, Ser. No. 668,185
Int. Cl.[2] B28B *7/34*
U.S. Cl. 106—38.35 **6 Claims**

1. In a suspension suitable for making molds useful in disposable pattern casting, consisting essentially of from 2.5 to 9.0 percent by weight of a C_2–C_4 alkyl silicate, from 16.5 to 23.0 percent by weight of water, from 0.05 to 0.25 percent by weight of hydrochloric acid, from 0.02 to 0.10 percent by weight of a surfactant selected from the group consisting of alkyl sulfates, alkyl-aryl sulfonates, salts of sulfosuccinic acid esters, sodium salts of condensation products of fatty acid chlorides with methyl taurine, oxy-ethylated alkyl phenols and aliphatic alcohols, glycidol derivatives of alkyl phenol and sulfonated oxy-ethylated compounds, the balance being refractory filler having a grain size of not more than 50 mu; the improvement comprising from 0.2 to 1.0 percent by weight of a phosphate selected from the group consisting of diphosphates of copper, magnesium, calcium, zinc, aluminum, titanium, chromium, manganese, iron, nickel, cobalt, zirconium and barium, alumochromophosphate and their mixtures.

4,113,500

SINTERED APATITE BODY

Masatomi Ebihara; Masahide Inoue, and Tsuneo Hidaka, all of Tsurugashima, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1977, Ser. No. 802,856
Claims priority, application Japan, Jun. 2, 1976, 51-64184
Int. Cl.[2] C04B *35/00*
U.S. Cl. 106—39.5 **2 Claims**

1. A sintered apatite body comprising the product obtained by molding and sintering a mixture consisting essentially of an apatite powder, $Ca_5(PO_4)_3OH$, and 0.01 to 20% by weight of $(Ca, Mg)_3(PO_4)_2$.

4,113,501

TEMPORARY SEALANT OF A NOZZLE OPENING OF SLIDING NOZZLE

Yoshito Edamoto, No. 3515, Totsuka-cho, Totsuka-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Jul. 28, 1977, Ser. No. 819,707
Int. Cl.[2] C04B *35/52*
U.S. Cl. 106—56 **6 Claims**

1. A composition adapted to be used as a temporary sealant in a nozzle opening which consists essentially of 92.0 to 98.8% by weight of at least one non-porous refractory material selected from the group consisting of siliceous sand, peridotite, chamotte, brick powder, bauxite, alumina, chromite, magnesia, dolomite, magnesite and spinel, said refractory material having a particle size distribution of more than 95% of said particles having a diameter ranging from 0.8 to 2.0 mm; 1 to 5% by weight of at least one carbonaceous material selected from the group consisting of graphite, coke, soot, charcoal, semi-coke and anthracite, said carbonaceous material having a particle size of less than 0.15 mm; and 0.2 to 3.0% by weight of at least one organic tackifier selected from the group consisting of starch, dextrin, sugar, mennan, algae starch, vegetable mucilage, glue, carboxy-methylcellulose, polyvinylates, polyvinyl alcohol, thermo-plastic resins, thermo-setting resins, cold-setting resins, pitch, asphalt, tar, heavy oil, caking coal, animal and plant drying oils.

4,113,502

ALUMINOUS REFRACTORY COMPOSITION

Harold L. Rechter, Chicago, Ill., assignor to Chicago Fire Brick Company, Chicago, Ill.

Filed Feb. 18, 1977, Ser. No. 770,117
The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.
Int. Cl.[2] C04B *7/00*
U.S. Cl. 106—67 **10 Claims**

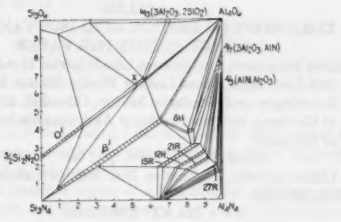
1. In a refractory composition comprising an aluminous refractory material including bentonite and a phosphate bonding agent, the improvement of having tetrasodium pyrophosphate present in the composition in amount effective to improve storage life.

4,113,503

METHOD OF FORMING A CERAMIC PRODUCT

Roland John Lumby; Bernard North, both of Birmingham, and Alfred James Taylor, Solihull, all of England, assignors to Lucas Industries Limited, Birmingham, England

Filed May 31, 1977, Ser. No. 802,172
Claims priority, application United Kingdom, Jun. 3, 1976, 22923/76
Int. Cl.[2] C04B *35/58*
U.S. Cl. 106—73.4 **6 Claims**



1. A method of forming a ceramic material consisting of at least 90% by weight of a single phase silicon aluminium oxynitride obeying the formula:

$$Si_{8-z}Al_zN_{8-z}O_z$$

where z is greater than 0 and less than or equal to 5, comprising the steps of:

a. producing a ceramic intermediary containing a silicon aluminium oxynitride which is one of the phases indicated at 15R, 8H, 12H, 21R and 27R in the attached quaternary phase diagram, and
b. with said intermediary in powder form, heating the intermediary at a temperature between 1200° C. and 2000° C. in a protective environment and in the presence of silicon nitride and silica, at least part of the silica being present as an inherent impurity on the silicon nitride, the composition of said intermediary and the amount of said silicon nitride and silica being such that said intermediary is converted at said temperature into said ceramic material.

4,113,504

DISPOSAL OF HEAVY METAL CONTAINING SLUDGE WASTES

Kon S. Chen, Norwalk, Conn., and Helmut W. Majewski, Nyack, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 3, 1977, Ser. No. 838,510
Int. Cl.[2] C04B 7/02
U.S. Cl. 106—97 7 Claims

1. A method of treating heavy metal containing sludge waste to produce a cementitious solid product having reduced heavy metal leachability by mechanically mixing said waste with fixing ingredients comprising vermiculite and cement, said waste and fixing ingredients being mixed in a proportion effective to set as a cementitious solid product.

4,113,505

ZONED COLORATION

Nicolo Bellanca, and Thomas Edward Furia, both of San Jose, Calif., assignors to Dynapol, Palo Alto, Calif.

Continuation of Ser. No. 612,508, Sep. 11, 1975, abandoned, which is a division of Ser. No. 460,908, Apr. 15, 1974, Pat. No. 3,937,851. This application May 23, 1977, Ser. No. 799,795
Int. Cl.[2] C08L 5/00; C09H 9/00
U.S. Cl. 106—137 4 Claims

1. A permanently multicolored composition comprising a plurality of zones of viscoelastic material, said zones having dissolved therein different coloring amounts of polymeric dyes, and thereby permanently differing in color from one another.

4,113,506

EMULSIONS OF RESINIC ACID ISOCYANATES AS SIZING AGENTS FOR PAPER

Günter Sackmann, Leverkusen; Udo-Winfried Hendricks, Odenthal-Voiswinkel; Hans-Ludwig Honig; Günter Kolb, both of Leverkusen, and Friedhelm Müller, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 10, 1976, Ser. No. 749,455
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557409
Int. Cl.[2] C08J 3/02
U.S. Cl. 106—238 3 Claims

1. An aqueous emulsion suitable as a sizing agent for paper or paper-like materials, the organic phase of said emulsion containing (1) a resinic acid isocyanate selected from the group consisting of dehydroabietyl isocyanate, dihydroabietyl isocyanate, tetrahydroabietyl isocyanate, polyabietyl isocyanate, dehydropimaric isocyanate, dihydropimaric isocyanate, tetrahydropimaric isocyanate and polypimaric isocyanate, (2) at least one emulsifying agent for said resinic acid isocyanate selected from the group consisting of non-ionic emulsifiers and anionic emulsifiers and (3) a water-immisible solvent for said resinic acid isocyanate and said emulsifying agent selected from the group consisting of aliphatic, alicyclic and aromatic hydrocarbons having from 5 to 20 carbon atoms, chlorinated aliphatic, alicyclic and aromatic hydrocarbons having from 5 to 20 carbon atoms and mixtures of said hydrocarbons, the ratio by weight of the organic phase to the aqueous phase being between 10:1 and 1:100, the resinic acid isocyanate content of said emulsion being from 0.01 to 80% by weight and the amount of emulsifier being between 0.5 and 20% by weight, based on the weight of said resinic acid isocyanate.

4,113,507

METHOD OF PREPARING A SOLUTION FOR MAKING ELECTROCONDUCTIVE TIN OXIDE FILMS

Donald L. McHenry, Galion, and Charles H. Bechtel, Mansfield, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 1, 1976, Ser. No. 746,270
Int. Cl.[2] H01B 1/08
U.S. Cl. 106—287.18 3 Claims

1. In a method of preparing a tin oxide film forming composition by combining a tin compound which is decomposable at elevated temperatures for depositing a film on a substrate, a fluorine-containing compound and an organic solvent and an amine wherein the composition is subject to volatilization during mixing, the improvement comprising:

establishing a volume of the prepared tin oxide film forming composition in a container for use as a starter batch, and

preparing subsequent batches of tin oxide film forming composition by adding the tin compound, the fluorine-containing compound and the amine as separate ingredients to the volume of prepared tin oxide film forming composition while mixing, wherein the added ingredients are in amounts sufficient to provide a final volume of the tin oxide film forming composition that is from two to three times the volume of the first volume, whereby volatilization from the composition is substantially eliminated.

4,113,508

IRON BLUE PIGMENT COMPOSITION AND PROCESS FOR ITS PRODUCTION

Johan Jozef Einerhand; Leonardus Johannes Hubertus Erkens, both of Maastricht; René Johannes Laenen, Bunde, and Joseph Wilhelmus Jacobus Hoofs, Meerssen, all of Netherlands, assignors to Hercules Incorporated, Wilmington, Del.

Filed Jun. 23, 1977, Ser. No. 809,336
Claims priority, application Netherlands, Jul. 7, 1976, 7607496
Int. Cl.[2] C09C 1/26
U.S. Cl. 106—304 10 Claims

1. In a process for producing an iron blue pigment composition in paste form by subjecting a mixture of water-wet iron blue and an oil binder to a flushing operation in the presence of an amine flushing agent until a separate water phase is formed, separating the water phase, removing residual water and recovering the resulting pigment composition, the improvement which consists of incorporating into the iron blue pigment composition at least one surfactant of the polyoxyethylene type.

4,113,509

ENZYMATICALLY PRODUCED MALTOSE-MALTOTRIOSE STARCH HYDROLYSATE

Harry Woods Leach, Willow Brook; Ronald Emil Hebeda, Woodridge, and Dennis John Holik, Naperville, all of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 577,523, May 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 437,452, Jan. 28, 1974, Pat. No. 3,915,618, which is a continuation-in-part of Ser. No. 349,899, Apr. 10, 1973, abandoned. This application Sep. 9, 1976, Ser. No. 721,926
Int. Cl.[2] C13K 1/06; C12D 13/02
U.S. Cl. 127—29 2 Claims

1. An enzymatically produced high maltose-maltotriose starch hydrolysate having a dextrose equivalent value in the range of from about 40 to about 55, and characterized as containing less than about 5%, by weight, dry basis, monosaccharides, from about 40% to about 55%, by weight, dry basis, disaccharides, from about 30% to about 45%, by weight, dry basis, trisaccharides, and about 20%, by weight, dry basis, polysaccharides having a degree of polymerization of four or more.

2. An enzymatically produced high maltose-maltotriose

starch hydrolysate having a dextrose equivalent value in the range of from about 40 to about 50, and characterized as containing less than about 3%, by weight, dry basis, monosaccharides, from about 45% to about 50%, by weight, dry basis, disaccharides, and from about 30% to about 40%, by weight, dry basis, trisaccharides, and the remainder being polysaccharides having a degree of polymerization of four or more.

4,113,510
PROCESS FOR REGENERATING FOUNDRY SAND

Gerard Yves Richard, Precy sur Oise, France, assignor to Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C., Asnieres, France

Continuation of Ser. No. 582,657, Jun. 2, 1975, abandoned. This application Oct. 8, 1976, Ser. No. 730,829
Claims priority, application France, Jun. 7, 1974, 74 19781
Int. Cl.[2] B08B *3/08*
U.S. Cl. 134—2 **7 Claims**

1. In a process for reclaiming a granular material in the form of particles of foundry sand which had been used for molds or cores and were bound by resins, in order to eliminate a pellicle of resinous binder material accumulated around each of the particles for reconstituting the characteristics of the granular material, the improvement comprising subjecting said particles to a chemical oxidizing treatment effective to oxidize said resinous binder pellicle with or without a chemical neutralization treatment by contacting said particles with a liquid containing, for said oxidizing treatment, a peroxide oxidant, the amount of said oxidant and the time of said chemical oxidizing treatment being sufficient to remove said pellicles of resinous binder about said particles, and, for the neutralization treatment, by contacting said particles with the same or a different liquid containing a base or an alkaline salt.

4. In a process for reclaiming a granular material in the form of particles of foundry sand which had been used for molds or cores and were bound by resins, in order to eliminate the pellicle of resinous binder material accumulated around each of the particles for reconstituting the characteristics of the granular material, the improvement comprising subjecting said particles to a chemical oxidizing treatment effective to oxidize said resinous binder pellicle with or without a chemical neutralization treatment by contacting said particles with a liquid containing, for said oxidizing treatment, an oxidant selected from the group consisting of potassium perchlorate, potassium dichromate, lead chromate, lead oxide, manganese dioxide, ammonium perchlorate, potassium nitrate, ammonium dichromate, potassium permanganate, nitrobenzene, sodium vanadate, sodium meta vanadate, sodium molybdate, sodium tungstate, titanate of dipropyl ditriethanolamine, n-propyl tannate, sodium chlorate, sodium chlorite, potassium chlorate, sodium perborate, sodium percarbonate, and sodium persulfate, the amount of said oxidant and the time of said chemical oxidizing treatment being sufficient to remove said pellicles of resinous binder about said particles, and, for the neutralization treatment, by contacting said particles with the same or a different liquid containing a base or an alkaline salt.

4,113,511
LIQUID ADDITIONS TO FUSED CHEMICAL BATHS

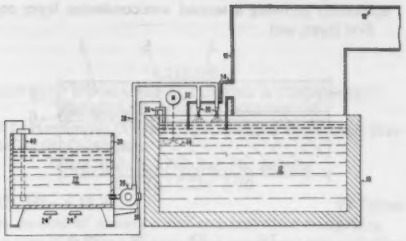
Robert H. Shoemaker, 1327 Northwood Blvd., Royal Oak, Mich. 48073, and William G. Wood, 274 Kercheval, Grosse Pointe Farms, both of Mich. 48236

Filed Jan. 17, 1977, Ser. No. 759,763
Int. Cl.[2] C23G *1/28*; B01F *1/00*
U.S. Cl. 134—10 **6 Claims**

1. A method of introducing a soluble chemical composition into an essentially non-aqueous fused chemical bath of which said composition constitutes a dissolved constituent, and wherein material to be treated is periodically introduced and removed from the bath, comprising the steps of,

dissolving said chemical composition in a volatile solvent having a boiling point less than the temperature of said bath,

providing spray nozzle means disposed to spray liquid droplets above said bath, and spraying said dissolved composition from said nozzle means above said bath in droplet size

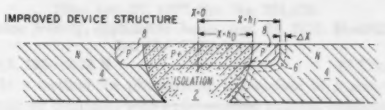


sufficiently small to allow said solvent to evaporate before said sprayed composition impinges on the surface of said bath, and agitating said bath, whereby the solvent will evaporate and the composition will enter the bath and become mixed therewith essentially free of volatile solvent.

4,113,512
TECHNIQUE FOR PREVENTING FORWARD BIASED EPI-ISOLATION DEGRADATION

Robert Lee Ayers, Manassas, and Raymond Weaver Hamaker, Catharpin, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1976, Ser. No. 736,646
Int. Cl.[2] H01L *21/265*
U.S. Cl. 148—1.5 **9 Claims**



1. A method of fabricating a semiconductor device so as to prevent forward biased epitaxial isolation junction degradation, comprising the steps of:

forming an isolation region of a first conductivity type having a width in a lateral direction and a first concentration in an epitaxial layer of a second conductivity type;

forming a guard ring of said first conductivity type having a second concentration less than said first concentration surrounding and contiguous with said isolation region extending beyond said isolation region in said lateral direction to prevent diffusion of ionic contaminants from said isolation region when the isolation region is forward biased relative to said epitaxial layer.

4,113,513
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE BY NON-SELECTIVELY IMPLANTING A ZONE OF PRE-DETERMINED LOW RESISTIVITY

Michel deBrebisson, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

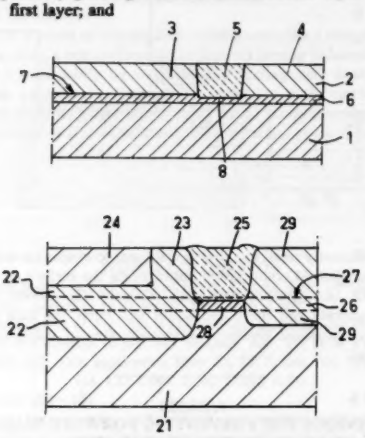
Filed Feb. 1, 1977, Ser. No. 764,587
Claims priority, application France, Feb. 16, 1976, 76 04169
Int. Cl.[2] H01L *21/265*
U.S. Cl. 148—1.5 **7 Claims**

1. A method of manufacturing a semiconductor device which comprises:

providing a substrate of a first type conductivity semiconductor material;

providing a first semiconductor layer of said first type conductivity and having a higher doping concentration than that of said substrate over the entire substrate surface by ion implantation;

epitaxially growing a second semiconductor layer on said first layer; and



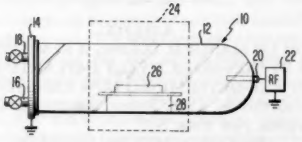
providing a localized zone of electrically isolating material which extends downwardly from the surface of said second layer through said second layer, and which contacts but does not extend entirely through said first layer, said localized zone providing electrical isolation between two regions of the second type conductivity situated on either side of said localized zone.

4,113,514

METHOD OF PASSIVATING A SEMICONDUCTOR DEVICE BY TREATMENT WITH ATOMIC HYDROGEN

Jacques Isaac Pankove, and Murray Alfred Lampert, both of Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,641
Int. Cl.² H01L *21/26, 21/265*
U.S. Cl. 148—1.5 **4 Claims**



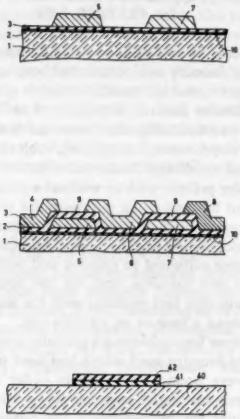
1. A method of passivating a semiconductor device having at least one active component disposed therein comprising exposing said device to atomic hydrogen at a temperature lower than about 450° C.

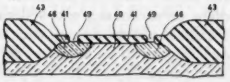
4,113,515

SEMICONDUCTOR MANUFACTURING METHOD USING BURIED NITRIDE FORMED BY A NITRIDATION TREATMENT IN THE PRESENCE OF ACTIVE NITROGEN

Else Kooi, and Joseph Gijsbertus vanLierop, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 592,867, Jul. 3, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 671,419
Claims priority, application Netherlands, Jun. 4, 1975, 7506594
Int. Cl.² H01L *21/265, 21/31*
U.S. Cl. 148—1.5 **25 Claims**



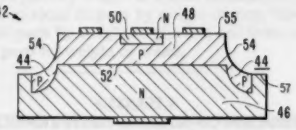


1. A method of manufacturing a semiconductor device, comprising providing a body having a silicon semiconductor surface region covered at least partly with a silicon oxide-containing layer, thereafter subjecting the silicon oxide-covered silicon region to a nitriding heat treatment in an atmosphere containing nitrogen capable of passing through the silicon oxide layer and chemically reacting at the silicon-silicon oxide interface until there is formed at the interface a nitrogen-containing material buried zone of a thickness capable of maintaining desired properties of the silicon portion under the buried zone during subsequent processing, and thereafter subjecting the body to processing which would cause a change in the properties of any silicon portions present which are not covered by the buried zone.

4,113,516
METHOD OF FORMING A CURVED IMPLANTED REGION IN A SEMICONDUCTOR BODY

Samuel Ponczak, and John Aaron Olmstead, both of Somerville, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 28, 1977, Ser. No. 763,721
Int. Cl.[2] H01L *21/265*
U.S. Cl. 148—1.5 5 Claims



1. A method of forming a region having a varying sheet resistivity in a body of semiconductor material which comprises the steps of:

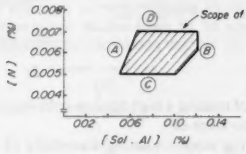
providing a body of semiconductor material having at least one concave curved surface along a side edge thereof; and

ion implanting conductivity modifying ions beneath said curved surface whereby a layer having a varying sheet resistivity is formed thereunder.

4,113,517
METHOD OF MAKING COLD-REDUCED AL-KILLED STEEL STRIP FOR PRESS-FORMING BY CONTINUOUS CASTING AND CONTINUOUS ANNEALING PROCESS

Kazuhide Nakaoka; Kenzi Araki; Akihiko Nishimoto, all of Yokohama; Kozi Iwase, Machida, and Haruo Kubotera, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 548,522, Feb. 10, 1975, abandoned. This application Aug. 12, 1976, Ser. No. 713,793
Claims priority, application Japan, Apr. 26, 1974, 49-46672
Int. Cl.[2] C21D *9/48*
U.S. Cl. 148—2 3 Claims



1. An improved method of making a press-formable cold reduced, Al-killed steel strip having low yield point and retarded aging properties, comprising the steps of

selectively controlling Nitrogen and Soluble Aluminum in the usual chemical composition of Al-killed steel in such a manner that the ratio of Sol. Al/N is within the range of 10 to 20 with N content being $0.005\% \leqq N \leqq 0.007\%$; and Sol. Al content being $10 \times N\% \leqq$ Sol. $\leqq 0.12\%$;

continuously casting said molten steel;

coiling, at the rolling stage, said steel strip at a temperature within the range of 700° C to 800° C to effect self-annealing; and

introducing the thusly treated steel strip into a continuous annealing process including an overaging treatment, said annealing process comprising the steps of

(A) heat from ambient temperature to 700 to 730° in 30 to 90 seconds;

(B) holding at the temperature of step (A) for 30 to 90 seconds;

(C) cooling at the rate of less than 30° C/sec to 550 to 650° C;

(D) rapidly cooling from the temperature of step (C) at the rate of more than 200° C/sec to ambient temperature;

(E) reheating to a temperature within the range of 300 to 500° C;

(F) slowly cooling from the temperature of step (E) but held within the range of 300 to 500° C for 30 to 180 seconds; and

(G) cooling at the rate of 3 to 170° C/sec.

4,113,518
METHOD OF MANUFACTURING A CORROSION RESISTANT ROTOR ASSEMBLY

David L. Henderson, O'Fallon, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Mar. 2, 1976, Ser. No. 663,146
Int. Cl.[2] C23F *7/10*
U.S. Cl. 148—6.15 Z 12 Claims

1. A method of making a rust-resistant rotor comprising

(a) a step of forming an assembled rotor, said step including mounting a laminated rotor core on a steel shaft,

(b) thereafter a step of treating the assembled rotor in its entirety with surface oil retention solution, comprising an aqueous metal phosphate solution, said step including wicking said solution between laminations of said laminated rotor core, and

(c) thereafter a step of coating the exposed surfaces of said assembled rotor with oil, said step including wicking said oil between laminations of said laminated rotor core.

4,113,519
PHOSPHATING OF METALLIC SUBSTRATE WITH ELECTROLYTIC REDUCTION OF NITRATE IONS

Shoji Oka, Nara; Ryoichi Murakami, Kyoto, and Akiko Sueyoshi, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Apr. 27, 1977, Ser. No. 791,470
Claims priority, application Japan, Apr. 27, 1976, 51-49023
Int. Cl.[2] C23F *7/10*
U.S. Cl. 148—6.15 R 17 Claims

1. In a method for phosphating the surface of a metallic substrate by treatment with a phosphating solution comprising nitrite ions and nitrate ions in an aqueous acidic medium, the improvement wherein the supply of the nitrite ions to the phosphating solution is carried out by electrolytic reduction of the nitrate ions therein by passing a direct current between an electrode as the cathode and an electrode as the anode dipped in the phosphating solution.

4,113,520
METHOD OF FORMING AN ALUMINUM OXIDE COATING

Geoffrey A. Dorsey, Jr., Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 13, 1976, Ser. No. 714,157
Int. Cl.[2] C23F *7/06*
U.S. Cl. 148—6.27 9 Claims

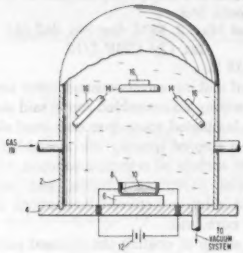
1. A method for developing an oxide coating less than 0.5 microns in thickness on an aluminum or aluminum alloy workpiece, wherein said oxide coating consists essentially of oxidized aluminum and alloy constituents from the metal of the workpiece, comprising treating the workpiece with an aqueous solution containing at least 0.001 gram/liter of a difficultly soluble magnesium compound, expressed as $MgCO_3$, with the temperature of the solution ranging from about 60° C. to the boiling point thereof, and with the pH of the solution ranging from 7–8.5.

4,113,521

PROCESS FOR PRODUCING MAGNETIC PARTICLES BY VACUUM EVAPORATION OF IRON WITH COLLECTION ON A MAGNETIZED SURFACE

Robert F. Bush, Poughkeepsie, and Joseph W. Mitchell, Montrose, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 460,842, Apr. 15, 1974, abandoned.
This application May 20, 1977, Ser. No. 799,034
The portion of the term of this patent subsequent to Jun. 12, 1994, has been disclaimed.
Int. Cl.[2] B22F 9/00; C23F 7/06; H01F 1/06
U.S. Cl. 148—6.35 7 Claims



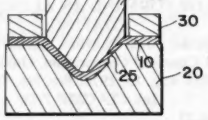
1. In a method for producing magnetic particles for use in making magnetic inks comprising the steps of
(a) placing substantially pure iron in a refractory support in a chamber that has been evacuated to a pressure of 10^{-6} mm.,
(b) backfilling said chamber with argon,
(c) heating said iron to its evaporation temperature and retaining it at such temperature until all or a portion of said iron has been evaporated,
(d) collecting said evaporated particles on a magnetized surface lying in a straight line from said refractory support, and
(e) oxidizing said collected particles at normal room temperatures and pressures.

4,113,522

METHOD OF MAKING A METALLIC STRUCTURE BY COMBINED SUPERPLASTIC FORMING AND FORGING

C. Howard Hamilton, Thousand Oaks, and Leonard A. Ascani, Palos Verdes Estates, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 28, 1976, Ser. No. 736,671
Int. Cl.[2] C22F 1/00
U.S. Cl. 148—11.5 R 12 Claims



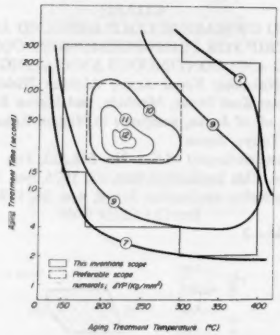
1. A method of making metallic structures comprising the steps of:
providing a metal preform having superplastic characteristics;
providing a shaping member substantially defining the desired final configuration of said preform;
bringing said preform to within a temperature range suitable for superplastic forming of said preform;
inducing tensile stress in said preform by applying pressure to said preform sufficient to cause at least a portion of said preform to expand superplastically; and
forging by increasing said pressure at least a portion of said preform against said shaping member.

4,113,523

PROCESS OF MAKING HIGH TENSION COLD-REDUCED AL-KILLED STEEL EXCELLENT IN ACCELERATED AGING PROPERTY

Kuniki Uchida; Kenzi Araki; Hirosi Narita; Shiro Fukunaka, and Takao Kurihara, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 491,375, Jul. 23, 1974, abandoned. This application Mar. 10, 1977, Ser. No. 776,288
Claims priority, application Japan, Jul. 25, 1973, 48/83045
Int. Cl.[2] C21D 7/02, 7/13, 7/14
U.S. Cl. 148—12.3 1 Claim



1. Process of making a high tension cold-reducing steel sheet comprising the steps of
(A) preparing steel consisting essentially of 0.04 to 0.12% carbon, 0.10 to 1.60% manganese, and 0.01 to 0.20% soluble aluminum and balance essentially of iron;
(B) hot rolling said steel at a finishing temperature of more than 800° C and a coiling temperature of less than 630° C to make Al and N partially solute in the steel;
(C) cold reducing said steel;
(D) and fully continuously annealing said steel by the sequential steps consisting essentially of
(a) heating said steel to a temperature within the range of more than A_1 to 850° C at the heating rate of more than 200° C/min and holding said temperature for 10 to 120 seconds,
(b) rapidly cooling said heated steel at a rate of more than 3,000° C/sec from said held temperature by jet stream of water to room temperature, thereby to form a dual phase structure of ferrite-martensite,
(c) reheating said steel to a temperature within the range of 180° C to 300° C and holding at said temperature for 20 to 120 seconds thereby to cause part of said carbon to remain in solution in said steel as well as partially precipitate carbon, and
(d) cooling and coiling thereby to impart bake hardening properties to the steel.

4,113,524

METHOD OF ASSEMBLING COMPONENTS ON PRINTED CIRCUIT BOARDS

George Katz, Philadelphia, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,679
Int. Cl.[2] B23K 35/34
U.S. Cl. 148—23 5 Claims

1. An extrudable, non-flowing, water soluble composition comprising 100 parts by weight of a solid polyalkylene glycol, from about 10 to about 30 parts by weight of soap, from about 10 to about 30 parts by weight of glycerin and from about 10 to about 100 parts by weight of water.

4,113,525

CARBOXYLIC ACID-CONTAINING WAX FLUXES

Robert A. Stayner, Lafayette; Richard C. Fox, San Rafael, and Thornton K. Jones, Greenbrae, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1977, Ser. No. 811,504
Int. Cl.[2] B23K 35/34
U.S. Cl. 148—23 6 Claims

1. A wax-flux composition comprising:
(a) a major amount of a wax having a melting point between 40° and 100° C; and
(b) an amount effective to cause fluxing, at or below the soldering temperature of the piece to be soldered, of a wax-dispersible C_{12} to C_{28} aliphatic carboxylic acid.

4,113,526

WAX FLUX COMPOSITIONS

Robert A. Stayner, Lafayette; Richard C. Fox, San Rafael, and Thornton K. Jones, Greenbrae, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 30, 1977, Ser. No. 811,505
Int. Cl.[2] B23K 35/34
U.S. Cl. 148—23 10 Claims

1. A wax-flux composition comprising:
(a) a major amount of a wax having a melting point between 40° and 100° C; and
(b) an amount effective to cause fluxing at or below the soldering temperature of the piece to be soldered of a waxsoluble phosphorus-containing acid of the formula

wherein R^1 and R^2 are hydrogen, hydroxyl, hydrocarbyl or hydrocarbyloxy and wherein the total number of carbon atoms contained in said R^1 and R^2 groups is from 8 to 30 carbon atoms, and n is 0 or 1.

4,113,527

CHROME STEEL CASTING

John Arden Larson, Easton, and Robert Bowlby Fischer, Gouldsboro, both of Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jul. 27, 1977, Ser. No. 819,355
Int. Cl.[2] C22C 38/12
U.S. Cl. 148—36 4 Claims

1. A chromium nickel casting manufactured from a steel consisting of:

Ingredient	Wt. Percent
Carbon (C)	less than 0.06
Manganese (Mn)	less than 1.0
Phosphorus (P)	less than 0.04
Sulfur (S)	less than 0.04
Silicon (Si)	less than 0.75
Aluminum (Al)	0.05 to 0.12

-continued

Ingredient	Wt. Percent
Chromium (Cr)	4.75 to 5.75
Molybdenum (Mo)	0.45 to 0.65
Nickel (Ni)	2.75 to 3.50
Iron (Fe)	essentially balance

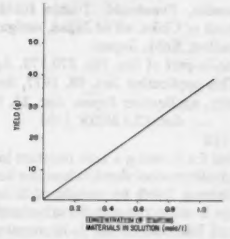
the finished casting manufactured to the standards of ASTM A 217 Gr. C5 and further having a first normalizing heat treatment at approximately 1900° F. (1038° C.) for 1 hour per inch of thickness, followed by air cooling to room temperature, followed by a second normalizing heat treatment at approximately 1600° F. (871° C.) for 1 hour per inch of thickness, followed by air cooling to room temperature, followed by a tempering at approximately 1200° F. (649° C.) for 2 hours per inch of thickness.

4,113,528

METHOD OF PREVENTING DETERIORATION OF CHARACTERISTICS OF FERROMAGNETIC METAL OR ALLOY PARTICLES

Yasumichi Tokuoka, and Kazumasa Fukuda, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 744,115
Claims priority, application Japan, Dec. 8, 1975, 50-146161
Int. Cl.[2] H01F 1/09
U.S. Cl. 148—105 4 Claims



1. A process for preparing ferromagnetic metal or alloy particles which comprises reducing ferromagnetic metal ions in a solution with a reducing agent under a magnetic field to obtain a slurry of ferromagnetic metal or alloy particles;
admixing with said slurry water in a volume quantity at least 30 times that of said slurry, and a quantity of air and at least one oxidizing agent selected from the group consisting of chromates, peroxides and permanganates sufficient to oxidize the surface of said ferromagnetic metal or alloy particles; adjusting the pH to range from about 6 to about 8; and recovering ferromagnetic metal or alloy particles having an oxidized surface.

4,113,529

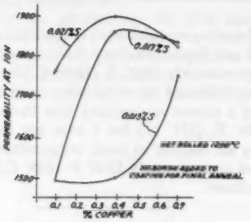
METHOD OF PRODUCING SILICON-IRON SHEET MATERIAL WITH COPPER AS A PARTIAL SUBSTITUTE FOR SULFUR, AND PRODUCT

Howard C. Fiedler, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,504
Int. Cl.[2] H01F 1/04
U.S. Cl. 148—111 7 Claims

1. The method of producing grain oriented silicon-iron sheet which comprises the steps of providing a silicon-iron melt containing 2.2 to 4.5 percent silicon, between about three and 35 parts per million boron, between about 30 and 75 parts per million nitrogen in the ratio to boron of one to 15 parts per part of boron, from 0.02 to 0.05 percent manganese, and sulfur and copper in amounts ranging respectively from 0.001 to 0.013

percent and 1.3 to 0.1 percent in the lower portion of the said manganese range and ranging respectively from 0.002 to 0.018 and 0.9 to 0.1 percent in the higher portion of said manganese range whereby the ratio of manganese to sulfur plus sulfur-equivalent copper is not greater than 1.7, casting the melt and



hot rolling the resulting billet to form an elongated sheet-like body, cold rolling the hot rolled body to provide a sheet of final gauge thickness, and subjecting the resulting cold-rolled sheet to a final heat treatment to decarburize it and to develop (110)[001] secondary recrystalline texture in it.

4,113,530

METHOD FOR FORMING A HEAT-RESISTANT INSULATING FILM ON A GRAIN ORIENTED SILICON STEEL SHEET

Hiroshi Shimanaka, Funabashi; Toshio Ichida, and Shigeru Kobayashi, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Continuation-in-part of Ser. No. 570,173, Apr. 21, 1975, abandoned. This application Jan. 18, 1977, Ser. No. 760,376
Claims priority, application Japan, Apr. 23, 1974, 49-45036
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—113 **5 Claims**

1. In a method for forming a heat resistant insulating film on a grain oriented silicon steel sheet, wherein a cold rolled silicon steel strip containing 2–4% by weight of Si and having a desired final gauge is subjected to a decarburization annealing at a temperature of 700°–900° C for 1–10 minutes in wet hydrogen to remove carbon contained in the steel strip and at the same time to oxidize silicon contained in the strip, forming an oxide film containing silica (SiO_2) on the surface of the steel strip, and an annealing separator consisting mainly of MgO is applied on the steel strip after which the steel strip is wound up in the form of a coil and subjected to a final annealing at a temperature of 1,000°–1,200° C under hydrogen atmosphere, the improvement comprising using an annealing separator containing 1–10% by weight of titanium oxide (TiO_2) having such a particle size that at least 99.5% by weight of the agglomerated particles passes through 325-mesh (44u) Tyler standard sieve and having a dispersion degree in water of at least 85%, so as to substantially avoid black $MgTi_2O_4$ particle formation.

4,113,531

PROCESS FOR FABRICATING POLYCRYSTALLINE INP-CDS SOLAR CELLS

Kenneth W. Zanio, Agoura, and Lewis M. Fraas, Malibu, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

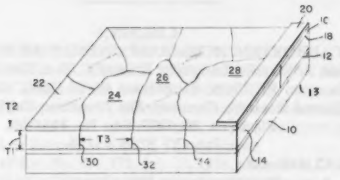
Filed Oct. 26, 1976, Ser. No. 735,560
Int. Cl.[2] H01L *21/36, 21/477, 27/14*
U.S. Cl. 148—174 **4 Claims**

1. A process for fabricating a polycrystalline indium phosphide-cadmium sulphide (InP/CdS) solar cell having large crystallites and a very thin layer of indium phosphide which comprises the steps of:

(a) depositing a layer of polycrystalline cadmium sulphide on a chosen substrate,

(b) heating said cadmium sulphide layer at a predetermined elevated temperature and time sufficient to induce a change in the crystal structure of said cadmium sulphide layer and substantially increase the size and lateral dimension of crystallites in said cadmium sulphide layer from approximately one micrometer to a lateral dimension of the order of 20 micrometers, and thereafter

(c) depositing a layer of polycrystalline indium phosphide on said polycrystalline cadmium sulphide layer and having an optical absorption length Λ and a thickness in the range of between 1 and 4 times Λ and further having relatively large crystallites with replicated grain sizes and bound-



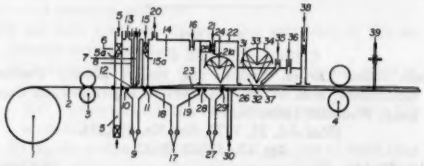
aries of approximately the same lateral spacing as those in said cadmium sulphide layer, whereby the lateral grain boundary spacing in both said cadmium sulphide and indium phosphide layers is between 5 and 20 times Λ, and substantial numbers of photon generated carriers in said indium phosphide layer will cross a PN junction between said indium phosphide and cadmium sulphide layers without or before reaching said grain boundaries therein, and enabling the relatively low cost polycrystalline semiconductor fabrication of InP/CdS solar cells utilizing relatively small amounts of indium.

4,113,532

PROCESS FOR PRODUCING LARGE-SIZE SUBSTRATE-BASED SEMICONDUCTOR MATERIAL UTILIZING VAPOR-PHASE DEPOSITION AND SUBSEQUENT RESOLIDIFICATION

Bernhard Authier; Rudolf Griesshammer, both of Burghausen; Franz Köppl, Altötting; Winfried Lang, Burghausen; Erhard Sirtl, Marktl, Inn, and Heinz-Jörg Rath, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Nov. 1, 1976, Ser. No. 737,249
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638269
Int. Cl.[2] H01L *21/477, 21/84, 31/00*
U.S. Cl. 148—174 **10 Claims**



1. A process for producing large-size, substrate-based semiconductor material of silicon deposited on a substrate body from the gaseous phase, which comprises the steps of heating a substrate body by direct current passage to deposition temperature, contacting said body with a gaseous silicon-containing mixture to which a dopant has been added, until a deposit having a thickness from about 10 to 200 μm has been formed, subsequently melting 80 to 100% of the deposited silicon layer

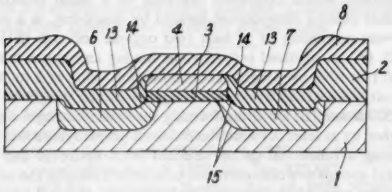
from the free surface downward, and resolidifying the molten silicon by adjustment of a temperature gradient from the substrate body upwardly to cause an oriented growth of the resolidifying silicon from the substrate body towards the free surface.

4,113,533

METHOD OF MAKING A MOS DEVICE

Tomisaburo Okumura, Kyoto; Hiroshi Okazaki, Takatsuki; Akira Tsuchitani, Joyo, and Seiji Ueda, Takatsuki, all of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Jan. 28, 1977, Ser. No. 763,679
Claims priority, application Japan, Jan. 30, 1976, 51-9871
Int. Cl.[2] H01L *29/78*
U.S. Cl. 148—187 9 Claims



1. A method of making a metal-oxide semiconductor device, said method including the following steps:

A. sequentially forming on a predetermined part of single crystal silicon substrate, (1) a silicon oxide film; (2) a polycrystalline film which, under processing conditions forms a conductor film, having a specified pattern, and serving as a diffusion mask thereafter as a gate electrode; and

B. diffusing an impurity into said substrate of step A from openings which are the parts other than those covered by said polycrystalline silicon film and said antioxidation film, said process characterized in that there is included the steps of

(i) forming an antioxidation film for preventing oxidation of said polycrystalline silicon film such that the antioxidation film has the same pattern as said polycrystalline silicon film, and the subsequent step of

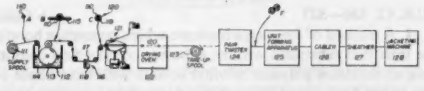
(ii) thermally oxidizing side-end parts of the silicon oxide film underneath said polycrystalline silicon film and also the specified parts of the surface of said silicon substrate.

4,113,534

PAPER PULP INSULATED CABLE AND METHOD OF MANUFACTURE

Thomas Charles Pound, Kingston, and Eric John Gouldson, Shawbridge, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Mar. 31, 1976, Ser. No. 672,366
Int. Cl.[2] H01B *13/06, 3/52*
U.S. Cl. 156—56 23 Claims



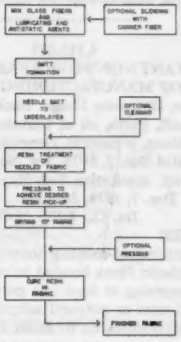
1. A method of making paper pulp insulated cable of 28 guage copper conductor comprising the steps of forming a paper pulp slurry having an average fiber length of 2.5 mm and a freeness of 480, applying the wet paper pulp from said slurry to said conductor in the amount of approximately 0.0194 grams/foot, and heating said conductor and said applied paper pulp to approximately 1500° F., 1150° F., and 650° F. for approximately 2 seconds at each temperature, twisting said insulated wire into pairs, stranding said pairs into units, and cabling said units into a core, sheathing said core with at least one layer.

4,113,535

HIGH TEMPERATURE FILTER FABRICS

Leonard R. Lefkowitz, Latham, and W. Henrik Krohn, Chatham, both of N.Y., assignors to Huyck Corporation, Wake Forest, N.C.

Division of Ser. No. 680,602, Apr. 27, 1976, Pat. No. 4,070,519.
This application Sep. 12, 1977, Ser. No. 832,316
Int. Cl.[2] B32B *5/06*
U.S. Cl. 156—148 11 Claims



1. A method of making a filter fabric comprising the steps of:

(a) mixing a lubricating agent with glass fibers having a diameter of from 2–8 microns;

(b) forming a non-woven batt layer from said glass fibers;

(c) forming a base layer from mineral fibers;

(d) resin impregnating and needling together said base layer and said batt;

(e) pressing said fabric to a degree sufficient to obtain a predetermined resin solids pickup;

(f) drying said fabric at a temperature sufficient to remove any liquid solvent; and

(g) heating said fabric at a temperature sufficient to cure said resin.

4,113,536

METHOD AND APPARATUS FOR AUTOMATICALLY MAKING FRAMES

Peter Grossmann, An der Muhle 27, 6570 Kirn, Germany

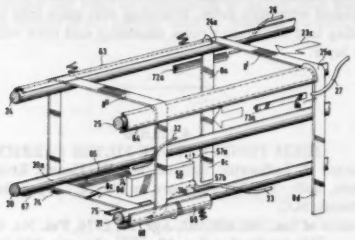
Filed Apr. 16, 1976, Ser. No. 677,541
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1975, 2517672
Int. Cl.[2] B29C *17/02, 24/00, 27/00*
U.S. Cl. 156—218 3 Claims

1. The method for making plastic frames having a plurality of straight portions connected by bent portions which comprises

heating elongated plastic workpieces of a heat sealable heat softenable plastic at longitudinally spaced areas corresponding to the portions to be bent,

successively moving each workpiece after it is heated continuously in a direction transverse to the direction of its length past a plurality of sets of stationary bending tools to

bend said workpiece successively at said heated areas and to bring the free ends of said workpiece into abutment,



heating the free ends of said workpiece,
and forcing the ends against one another to join the ends.

4,113,537

HEAT RESISTANT NONWOVEN FABRIC AND METHOD OF MANUFACTURING SAME

Werner Schäfer, Birkenau; Holger Buchwald, Hemsbach, and Dieter Bischoff, Furth, all of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Dec. 3, 1975, Ser. No. 637,488

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1974, 2458037; Dec. 7, 1974, 2458038

Int. Cl.[2] B32B *27/02*

U.S. Cl. 428—220 **8 Claims**

1. A high-temperature-resistant nonwoven fabric comprising crystalline synthetic fibers bonded to one another by fusion, said fibers comprising at least one polyaryl amide, polyaryl imide, polyaryl ester or polyaryl anhydride, said fibers being resistant to temperatures up to about 350° C. and the fabric being resistant to prolonged exposure to a temperature of at least 200° C.

4,113,538

METHOD OF AND MEANS FOR MOUNTING LABELS

Russell W. Green, P.O. Box 155, Wayne, Ill. 60184

Filed Aug. 24, 1976, Ser. No. 717,232

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—247 **5 Claims**

1. The method of adhesively securing to a sheet an adhesive coated label having a split backing covering the adhesive comprising laying said label on with its backing contacting said sheet, folding said label along said split to provide an upstanding portion, applying pressure against the side opposite the backing of said upstanding to cause the related backing portion to peel off said label and force said uncovered adhesive against said sheet, folding the other half of said label along said split to provide an upstanding portion, and applying pressure against the side opposite the backing of said upstanding portion to cause the related backing portion to peel off said label and force said uncovered adhesive against said sheet.

4. The method of removing a split backing from an adhesive coated label while attaching said label to a surface comprising the steps of folding said label upwardly along the line of said split to provide an upstanding portion, locating a straight edge at the fold on the side opposite the backing and advancing it against the upstanding portion to cause the related backing portion to peel off and to press the adhesive coated label portion against the surface, folding the other unattached portion of the label upwardly along the line of the split, locating a straight edge at the fold on the side opposite the backing and advancing it in the other direction against said upstanding portion to cause the related backing portion to peel off and to press the last named adhesive coated label portion against said surface.

4,113,539

OLEFIN RESIN-METAL BONDED STRUCTURE

Hisashi Hotta, and Fumio Mori, both of Yokohama, Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Division of Ser. No. 678,053, Apr. 19, 1976, Pat. No. 4,062,997. This application Jun. 20, 1977, Ser. No. 808,301

Int. Cl.[2] C09J *5/00, 7/00*

U.S. Cl. 156—306 **1 Claim**

1. A process for the preparation of olefin resin-metal bonded structure, which comprises applying on a metal substrate a primer coating composition formed by dissolving, in a mixed solvent consisting of at least two organic solvents (S1) and (S2), (A) an oxidized polyethylene having an oxygen content of 0.1 to 10% by weight, a saponification value of 2 to 200, a density of 0.90 to 1.2 and an average molecular weight of 1000 to 50000 and (B) a coating-forming base resin having a density higher by at least 0.1 than the oxidized polyethylene and containing a functional group selected from hydroxyl and carbonyl groups at a concentration of at least 1 meq/g, the mixing weight ratio of the oxidized polyethylene (A) and the base resin (B) being within the following range:

(A) : (B) = from 0.2 : 99.8 to 45 : 55,

the difference of the boiling point of the solvent (S1) having a highest boiling point among the mixed solvent-constituting solvents and the boiling point of the solvent (S2) having a lowest boiling point among the mixed solvent-constituting solvents being at least 20° C. and each of solvents (S1) and (S2) being present in the mixed solvent in an amount ranging from 10 to 70% by weight based on the total mixed solvent; heating the coating formed on the metal substrate at a temperature higher than the melting point of said oxidized polyethylene to evaporate the mixed solvent and thus form a primer layer having a multilayer distribution structure in which the base resin is predominantly concentrated on that side of the primer layer toward the metal substrate and the oxidized polyethylene is predominantly concentrated on that side of the primer layer opposite said metal substrate applying an olefin resin layer to said primer layer and fusion-bonding the olefin resin layer to said metal substrate through said primer layer under application of heat and pressure.

4,113,540

USE OF MULTIFUNCTIONAL MONOMERS IN THE PREPARATIONS OF EMULSIONS TO BE USED IN ADHESIVES

Ralph F. Patella, South Plainfield, and Edward J. Kuzma, Woodbridge, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 760,879, Jan. 21, 1977, abandoned. This application Dec. 2, 1977, Ser. No. 856,829

Int. Cl.[2] C09J *3/12*

U.S. Cl. 156—327 **5 Claims**

1. A method of forming a laminate which comprises bonding at least two substrates with an adhesive composition comprising an emulsion polymer of vinyl acetate with from about 5% to about 50% by weight of alkyl acrylate or methacrylate based on the total weight of vinyl acetate and alkyl acrylate or methacrylate and from about 2% to about 10% by weight, based on the total weight of said polymer, of an acrylic or methacrylic acid ester of a polyol in which at least three hydroxyl groups are esterified.

4,113,541

METHOD OF BONDING USING AN IMPROVED EPOXY COMPOSITION CONTAINING CHLORINE CONTAINING POLYOLS

Richard J. Turley, Orange, and Alexandre Ozolins, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 625,903, Oct. 28, 1975, Pat. No. 4,052,349. This application Jun. 17, 1977, Ser. No. 807,456
Int. Cl.[2] C08G *59/62*
U.S. Cl. 156—330 12 Claims

1. In a method of bonding two surfaces together by means of an adhesive, the improvement of employing as said adhesive, a liquid, curable epoxy composition comprised of

(a) an epoxy resin having more than one α-epoxy group in the molecule,

(b) a curing agent for said resin, and

(c) a chlorine-containing polyether polyol having an average of 2–8 hydroxy groups and at least one (2,2-dichlorovinyl) ethylene group in the polyether polyol chain.

4,113,542

METHOD OF JOINING WOOD PRODUCTS

Ingvar Johansson, Spanga, Sweden, assignor to Svenska Traforskningsinstitutet, Stockholm, Sweden

Continuation of Ser. No. 692,950, Jun. 4, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,517
Claims priority, application Sweden, Jun. 13, 1975, 7506833
Int. Cl.[2] C09J *3/28, 3/16*
U.S. Cl. 156—335 10 Claims

1. A method of joining wood products together with an adhesive, comprising the steps of:

mixing lignin with a solution consisting essentially of phenol and a compound selected from the class consisting of formaldehyde and a substance yielding formaldehyde at a low temperature such that no substantial reaction takes place so that said phenol and said formaldehyde are absorbed by said lignin,

applying said lignin-phenol-formaldehyde mixture to the wood surfaces of said wood products to be joined, and

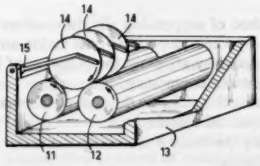
reacting said phenol and said formaldehyde with said lignin by heating so that a hardened lignin adhesive joins said wood products.

4,113,543

APPARATUS FOR ETCHING THE EDGES OF SEMICONDUCTOR PLATES

Yvon Salles, Epron; Pierre Léger, Thaon, and Gérard André David, Caen, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,345
Claims priority, application France, Oct. 3, 1975, 75 30332
Int. Cl.[2] H01L *21/306*
U.S. Cl. 156—345 4 Claims



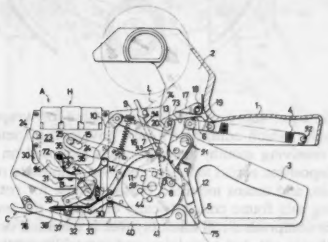
1. An apparatus for mechanochemical etching of the side wall of a circular plate, comprising a container for receiving an etching solution, at least one roller having a longitudinal axis and a circular cylindrical surface, means for mounting said roller in said container so that its longitudinal axis is horizontal and a lower portion only of said surface the roller is submerged in etching solution, means for rotating said roller about said axis, and means for holding a plate with its side wall in rolling contact with said roller surface only and above said etching solution, said plate being in a vertical position with faces of the plate perpendicular to the roller axis.

4,113,544

PORTABLE LABEL PRINTING AND APPLYING MACHINE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Dec. 15, 1976, Ser. No. 750,845
Claims priority, application Japan, Dec. 20, 1975, 50-151235; Dec. 31, 1975, 51-158620
Int. Cl.[2] B41F *1/08, 1/38, 1/44*
U.S. Cl. 156—384 52 Claims



1. A portable label printing and applying machine, comprising:

a machine frame; a platen supported by said machine frame; label moving means for moving a label onto said platen to be imprinted;

an operating lever supported by and movable with respect to said machine frame between a first and a second position;

a printing head supported by and movable with respect to said machine frame between a third and a fourth position; said printing head including printing types; at said fourth position of said printing head, said printing types being in position to engage and engaging a label on said platen and imprinting the same;

biasing means operatively connected between said operating lever and said printing head for biasing said printing head away from said third position toward said fourth position as said operating lever is operated toward said second position;

printing head restraining means connected with said printing head for restraining movement thereof toward said fourth position as said operating lever is moving toward said second position;

restraining means release means connected with said restraining means and with said operating lever for moving said restraining means to release said printing head to move to said fourth position when said operating lever has moved a predetermined distance toward said second position, said biasing means then urging said printing head toward said fourth position; at said fourth position, said printing types facing toward and engaging and imprinting a label then on said platen;

return means connected with said printing head for lifting said printing head off said fourth position and away from engagement with a label following imprinting of the label and prior to commencement of return of said operating lever toward said first position thereof.

4,113,545

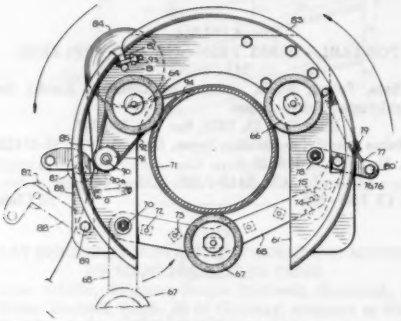
PIPE JOINT WRAPPING MACHINE

Linden Stuart, Jr., Chester, N.J., and Harry Robert Davis, Lost Creek, W. Va., assignors to Stuart Steel Protection Corporation, South Bound Brook, N.J.

Filed Jul. 29, 1977, Ser. No. 820,292

Int. Cl.[2] B32B *31/00*; B65H *81/00*

U.S. Cl. 156—392 **7 Claims**



1. In a portable pipe wrapping machine for wrapping a pipe manually which comprises a pipe enveloping frame having a pipe receiving mouth, locking means mounted on said frame for disposition across said pipe receiving mouth to retain a pipe therein, and means mounted on said frame for rotatably supporting said frame concentrically on a pipe, the improvement which comprises a roll assembly that is mounted on said frame and that is adapted to receive and rotatably support a roll of wrapping material preformed with a separator sheet that is strippable therefrom and that in said roll separates adjoining plies of said wrapping material from each other with said roll in position for feeding wrapping material from said roll onto said pipe during rotation of said frame about said pipe, a sheet receiving assembly mounted in said frame that comprises a rotatable member presenting when rotated a moving surface adapted and positioned for receiving said separator sheet that is stripped from said wrapping material concomitantly with travel of said wrapping material from said roll to said pipe during rotation of said frame about said pipe, a wheel rotatably mounted in secured relation to said frame for frictional contact with said pipe and for rotation responsive to rotation of said frame about said pipe with said wheel in frictional contact therewith, means responsive to rotation of said wheel for rotating said rotatable member with movement of said travelling surface presented thereby at a rate sufficient to recieve thereon said protector sheet as it is stripped from said wrapping material during travel of said wrapping material from said roll to said pipe.

4,113,546

APPARATUS FOR PRODUCING TUBES BY HELICALLY WINDING SHEETS

Dietmar Anders, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Fed. Rep. of Germany

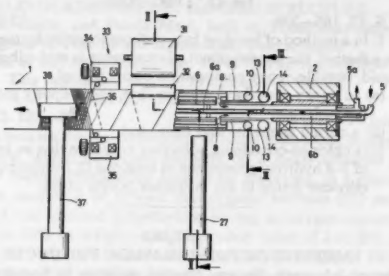
Filed Apr. 12, 1977, Ser. No. 786,859

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2617140

Int. Cl.[2] B65H *81/00*

U.S. Cl. 156—431 **22 Claims**

1. Apparatus for producing tubes by helically winding strips of thermoplastics synthetic sheet material, the combination comprising a double-shell coolable draw-off mandrel onto which said sheet material at a temperature at which it is fusible is wound spirally in overlapping manner in such a way that it is formed into a tube with an obliquely extending winding seam, pull-off apparatus to cause and permit axial and rotational movement of said tube relative to said draw-off mandrel, first inner endless conveyor belts movable axially in relation to said draw-off mandrel, extending in the longitudinal direction around an outer shell of said draw-off mandrel and tensioned by a tensioning device, second inner endless conveyor belts overlapping said first inner conveyor belts and extending in the longitudinal direction on the outer shell and tensioned by



tensioning means, said first and said second inner endless conveyor belts being movable axially with respect to the draw-off mandrel, guide rollers within said draw-off mandrel to feed back said first and said second inner endless conveyor belts, said first and said said second inner endless conveyor belts being driven by said pull-off apparatus directly or by way of said tube extruded thereon, and cooling means to act directly on said sheet material wound into said tube.

4,113,547

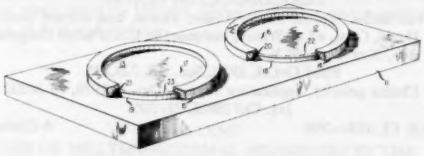
FORMATION OF EPITAXIAL LAYERS ON SUBSTRATE WAFERS UTILIZING AN INERT HEAT RADIATION RING TO PROMOTE UNIFORM HEATING

Lewis Emanuel Katz, and Carl Lewis Paulnack, both of Allentown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 729,682, Oct. 5, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,126

Int. Cl.[2] H01L *21/205*; C23C *13/08*; H05B *5/08*

U.S. Cl. 156—612 **4 Claims**



1. A method of suppressing slip dislocations in an epitaxial film grown by vapor deposition on a major surface of a semiconductor wafer by affecting the radiation of heat from portions of the wafer comprising;

(a) mounting the wafer on the surface of a susceptor member in an epitaxial reactor,

(b) heating the reactor including the wafer to an elevated temperature,

(c) depositing a film of epitaxial semiconductor material on the major surface of the wafer, and

(d) reducing the emission of heat from the rim and peripheral surface portions of the wafer by encircling the wafer with a ring of inert material which encloses both the rim and the peripheral portion of the major surface without touching the wafer, thereby to produce a substantially uniform temperature profile across the wafer.

4,113,548

PROCESS FOR THE PRODUCTION OF SILICON LAYERS

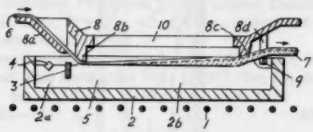
Hermann Sigmund, No. 88, Waldhornstrasse, 8034 Germering, Fed. Rep. of Germany

Filed May 11, 1977, Ser. No. 795,844

Claims priority, application Fed. Rep. of Germany, May 13, 1976, 2621145

Int. Cl.[2] H01L *21/368, 21/208*

U.S. Cl. 156—622 9 Claims



1. A process for the production of a semi-conducting silicon layer on a foreign substrate by means of melt epitaxy, wherein silicon is dissolved in an aluminum-zinc melt and a strip-like oxidized aluminum film is drawn across the surface of the melt solution.

4,113,549

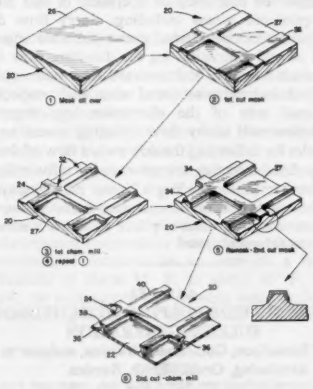
CHEMICAL MILLING PROCESS

Daniel J. Brimm, La Jolla, Calif., assignor to Chem-tronics, Inc., Santee, Calif.

Filed Apr. 6, 1977, Ser. No. 785,168

Int. Cl.[2] C23F *1/02*

U.S. Cl. 156—639 11 Claims



1. A method of chemically shaping a metallic workpiece to impart a selected configuration thereto which comprises the steps of: masking said workpiece; removing the masking from those areas of the workpiece in which metal is to be removed; immersing the workpiece in a body of a liquid etching composition to effect a controlled removal of metal from the workpiece; stripping the remaining original mask from and remasking said workpiece; removing that masking from areas in which the removal of additional metal is wanted; and immersing the workpiece in a body of liquid etching composition to effect said additional removal of metal, the workpiece being simultaneously rotated about two mutually perpendicular axes during these periods that it is immersed in a liquid etching composition to promote even and uniform etching of the workpiece.

4,113,550

METHOD FOR FABRICATING SEMICONDUCTOR DEVICE AND ETCHANT FOR POLYMER RESIN

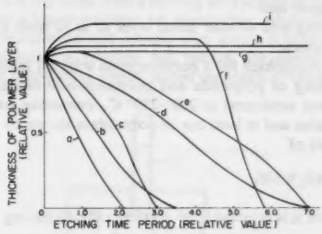
Atsushi Saiki, Musashimurayama; Toshio Okubo, Tokyo, and Seiki Harada, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 607,562, Aug. 25, 1975, abandoned. This application Jun. 11, 1976, Ser. No. 695,040

Claims priority, application Japan, Aug. 13, 1975, 50-98179; Aug. 23, 1974, 49-96157

Int. Cl.[2] H01L *7/00;* C09K *13/00;* C23F *1/00*

U.S. Cl. 156—656 73 Claims



1. A method for fabricating a semiconductor device comprising the steps of:

forming, on a body, a layer of semicured polymer resin selected from the group consisting of polyimide and polyimide-iso-indroquinazolinedione and semicured at 200°–250° C.; and

contacting an etchant consisting essentially of hydrazine or hydrazine hydrate and at least one of polyamines shown by a chemical formula of

$NH_2.R.NH_2$,

wherein R is selected from divalent radicals having 2–6 carbon atoms, the temperature of said etchant being in a range from 20° C. to 30° C., to a prescribed portion of said semicured layer so as to form an opening at said prescribed portion.

28. A method for fabricating a semiconductor device comprising the steps of:

forming at least one circuit element in a semiconductor body;

forming an insulating layer on the surface of said body;

forming at least one opening at prescribed portions of said insulating layer for exposing prescribed surfaces of said circuit element;

forming a metal layer on the surface of said insulating layer and on said exposed surface of said circuit element;

selectively etching said metal layer for forming a prescribed pattern of said metal layer, whereby prescribed surfaces of said insulating layer are exposed;

forming a layer of semicured prepolymer resin selected from the group consisting of polyimide and polyimide-iso-indroquinazolinedione and semicured at 200°–250° C., on the surfaces of said metal layer and exposed surfaces of said insulating layer;

forming a photoresist layer on the surface of said semicured prepolymer layer;

forming a prescribed pattern on said photoresist layer, so that prescribed surfaces of said semicured prepolymer layer are exposed;

contacting an etchant consisting essentially of hydrazine or

hydrazine hydrate and polyamine shown by a chemical formula of

$NH_2.R.NH_2$,

wherein R is selected from divalent radicals having 2–6 carbon atoms, the temperature of said etchant being in a range from 20° C. to 30° C. to the exposed surface of said prepolymer layer, so as to etch said prepolymer layer and to expose prescribed surfaces of said metal layer;

removing said photoresist layer;

curing said semicured prepolymer so as to form a cured layer of said polymer resin;

forming another metal layer on the surface of said cured polymer resin layer and exposed surface of said metal layer; and

etching said another metal layer so as to form a prescribed pattern.

52. An etchant for a polymer resin selected from the group consisting of polyimide and polyimide-isoindroquinazolinedione and semicured at 200°–250° C., consisting essentially of hydrazine and at least one of polyamines shown by a chemical formula of

$NH_2.R.NH_2$

wherein R is selected from divalent radicals having 2–6 carbon atoms.

4,113,551

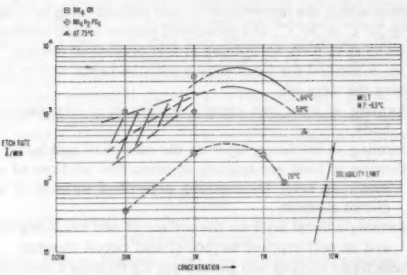
POLYCRYSTALLINE SILICON ETCHING WITH TETRAMETHYLAMMONIUM HYDROXIDE

Ernest Bassous, Riverdale, N.Y., and Cheng-Yih Liu, Woodbridge, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 743,362, Nov. 19, 1976, abandoned. This application Dec. 16, 1977, Ser. No. 861,373

Int. Cl.² H01L *21/306*

U.S. Cl. 156—662 **18 Claims**



10. A method for etching a polycrystalline silicon workpiece, comprising the step of:

applying to the surface of a polycrystalline silicon workpiece, an aqueous solution of

$N[R_a]_m[R_b]_{4-m}OH$,

containing no separate oxidant, where R_a and R_b are first and second alkyl groups respectively, and m is an integar of from 0 to 4, having a molar concentration in the range of from 0.0001 molar to the solubility limit at the etching temperature.

4,113,552

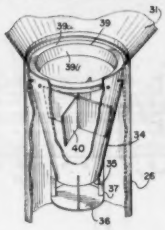
ELUTRIATION LEG AND METHOD

Frank Bella, Jr., South Holland, and Richard C. Bennett, Park Forest, both of Ill., assignors to Whiting Corporation, Harvey, Ill.

Filed Aug. 5, 1976, Ser. No. 712,033

Int. Cl.² B01D *1/30, 9/02*

U.S. Cl. 159—27 A **43 Claims**



1. In an apparatus which includes a main vessel wherein a slurry body containing solids to be recovered therefrom is subjected to agitational forces, which solids are gravitationally discharged as part of a slurry flow into the upper ends of a generably cylindrical elutriation leg mounted directly to the lower end of said main vessel, said leg including a feed inlet through which an elutriation liquor which is relatively weaker in dissolved solids than the liquor portion of said slurry is introduced for upward travel through said leg and into said main vessel, and means for removing solids in said leg adjacent the lower end thereof, the improvement comprising quiescent means for effectively minimizing the transfer of said agitational forces from said main vessel to said elutriation leg so as to provide improved efficiency of operation in said elutriation leg, said quiescent means including: slurry flow directing means including an open-ended sleeve mounted adjacent the upper end of said elutriation leg for directing flow of slurry from said main vessel in a downward flow path which is of generally reduced cross-sectional area with respect to the cross-sectional area of the elutriation leg; target means mounted below said slurry flow directing means and above said feed inlet for deflecting the downward flow of slurry from said slurry flow directing means radially outwardly; liquor flow directing means including a liquor passageway located adjacent the upper portion of said open-ended sleeve through which liquor which is relatively free of solids is directed for passage into said main vessel.

4,113,553

SODIUM SULFIDE PULPING WITH HYDROGEN SULFIDE GENERATION

Hans Olof Samuelson, Gothenburg, Sweden, assignor to Mo Och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Jan. 27, 1977, Ser. No. 763,203

Claims priority, application Sweden, Feb. 5, 1976, 7601284

Int. Cl.² D21C *3/02, 11/12*

U.S. Cl. 162—34 **23 Claims**

1. A process for pulping hardwood to produce cellulose pulp in good yield and of high quality, with a low requirement for causticized pulping liquor, which comprises in a first pulping stage, in the absence of added carbon dioxide, pulping the hardwood in an alkaline pulping liquor containing sodium sulfide at a pH within the range from about 10.5 to about 13 and at a temperature within the range from about 110° to about 170° C for a time sufficient to consume at least 3%, based on the dry weight of the wood, of alkali in the pulping liquor, determined as titratable alkali, in chemical reactions with the wood, thereby forming a large proportion of soluble organic acids in the pulping liquor, and generating hydrogen sulfide in situ in the alkaline pulping liquor by reaction of sodium sulfide

with said organic acids; and then in a second pulping stage, following directly after the first pulping stage, continuing the pulping at a pH higher than said first stage pH, within the range from about 12.5 to about 14, and at a temperature higher than said first stage temperature, within the range from about 145° to about 190° C, in the presence of added alkaline pulping liquor comprising sodium hydroxide and sodium sulfide until cellulose pulp is produced.

4,113,554

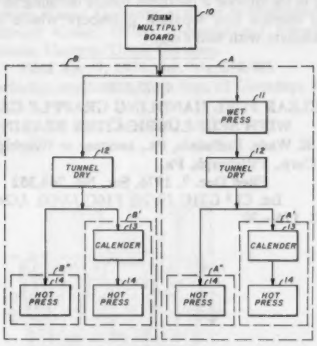
METHOD OF MANUFACTURING INSULATING BOARD

Francis J. McGarry, Thompson; Donald Greene, Danielson, and Jeffrey B. Otto, Brooklyn, all of Conn., assignors to Rogers Corporation, Rogers, Conn.

Continuation-in-part of Ser. No. 654,847, Feb. 3, 1976, abandoned. This application Nov. 1, 1977, Ser. No. 847,571

Int. Cl.² D21F *11/08*; D21J *1/04, 1/20*

U.S. Cl. 162—123 **10 Claims**



1. A process of forming insulating board comprising the steps of:

forming a wet multi-ply board of fibrous material, substantially free of resin, the board being formed on the roll of a wet cylinder machine;

drying the multi-ply board to reduce the moisture content thereof to about 1 to about 15%; and

asymmetrically hot pressing the dry board by pressing and heating the felt side of the board at a first predetermined temperature and pressing and heating the roll side of the board at a second predetermined temperature, the first predetermined temperature being higher than the second predetermined temperature to establish a temperature differential of about 15° F. to about 40° F. across the board, the asymmetric hot pressing being under pressure and occurring for at least 30 seconds.

4,113,555

HARD BOARD OR MEDIUM DENSITY BOARD, PROCESS FOR PRODUCTION THEREOF AND MEANS FOR PRACTICIZING THE PROCESS

Jan O. Nyrén, Grodinge; Sören B. Nordin, Johanneshov, and Leif A. Flodman, Lidingo, all of Sweden, assignors to Svenska Traforskningsinstitutet, Stockholm, Sweden

Continuation-in-part of Ser. No. 519,203, Oct. 30, 1974, abandoned. This application Jan. 21, 1977, Ser. No. 761,209

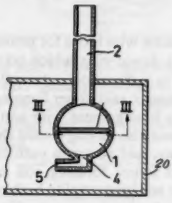
Claims priority, application Sweden, Nov. 8, 1973, 7315156

Int. Cl.² D21J *1/18*

U.S. Cl. 162—127 **20 Claims**

1. In a wallboard selected from the group consisting of hardboard having a density of 800–1100 kg/m³ and medium density board having a density of 400–800 kg/m³ made from lignocellulosic fibers, the thickness of the board being 2-25 mm and the board having two surface layers each comprising at least 10% of the board thickness and therebetween a central layer comprising 10–70% of the board thickness and prepared according to the wet process and being reinforced with a set resin, the improvement comprising: the central layer having a mean content of 1–15% by weight of said resin, based on the central layer, distributed evenly throughout said layer and the surface layers having a mean content of said resin of less than 1% by weight, the ratio of the mean resin content of said central layer and that of each of said surface layers being at least 4:1 and the resin content of the central layer steadily decreasing to that of the surface layers and there being no zone of the board having higher resin content than the central layer.

5. In a process for the preparation of building board selected from the group consisting of hard and medium density board made from lignocellulosic fibers, wherein an aqueous suspension of said lignocellulosic fibers having a consistency in the range of 1.0–4.0% is fed onto a moving wire screen of Fourdrinier type in a board machine for dewatering, whereafter the wet lap dewatered on said moving wire screen is subjected to the normal steps of pressing and baking, the improvement comprising introducing evenly across the width of the suspen-



sion an aqueous solution of a thermosetting resin into a central layer of said lignocellulosic fiber suspension having a consistency in said range near the headbox of said board machine such that the resin content of the central layer steadily decreases to that of the surface layers and such that there is no zone of the board having higher resin content than the central layer.

14. In a board making machine wherein a pulp slurry flow of a consistency of less than 4% is fed on to a moving wire screen, the improvement comprising a device for introducing a thermosetting resin solution into the pulp slurry flow in the direction of the slurry flow, said device comprising a straight pipe having the ends closed, the pipe being disposed in the slurry and transversely to the direction of the slurry flow and being provided with an internal partition plate provided with holes for distributing solution admitted to the pipe uniformly along the pipe, nozzles connected to the pipe and directed in the pulp flow direction, inlet means for feeding solution to the portion of the pipe other than that connected to the nozzles, and means for holding the device in position in the pulp flow.

4,113,556

PAPER MACHINE WITH TWIN-WIRE FORMER

Matti Kankaanpää, Espoo, Finland, assignor to Valmet Oy, Japan

Filed Apr. 14, 1977, Ser. No. 787,321

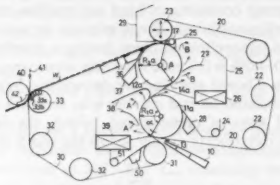
Claims priority, application Finland, Apr. 14, 1976, 761030

Int. Cl.² D21F *1/00, 9/00*

U.S. Cl. 162—272 **20 Claims**

1. In a paper machine, a pair of endless wire loops respectively having elongated portions which travel together upwardly along a common path where said wire loops form a twin-wire former, said common path having a lower receiving end for receiving pulp stock from which a web is to be formed and an upper discharge end from which a web issues from said twin-wire former while being transported by one of said endless wire loops beyond said discharge end of said common path, lower forming roll means around which said endless wire loops are lapped with said lower forming roll means determining the lower receiving end of said common path and an initial

portion of said common path along which the wire loops travel together, upper forming roll means around which said endless wire loops also are lapped with said upper forming roll means determining the discharge end of said common path and a final portion of said common path, said lower and upper forming roll means cooperating with said endless wire loops for providing at said lower and upper forming roll means dewatering which at least in part occurs in opposite directions at said lower and upper forming roll means, respectively, and said lower forming roll means having a solid shell through which fluid cannot penetrate and said lower forming roll means cooperating with said endless wire loops for providing at said lower forming roll means a dewatering which takes place at least to a substantial extent in a direction outwardly away from said lower forming roll means, said upper forming roll means being situated substantially in alignment with and above said lower forming roll means and also having a solid shell through which fluid cannot penetrate, said common path curving first in one direction about said lower forming roll means, then being substantially straight and tangential to both of said forming roll means, and then curving in an opposite direction around said upper forming roll means, so that said common path is of a substantially S-shaped configuration.

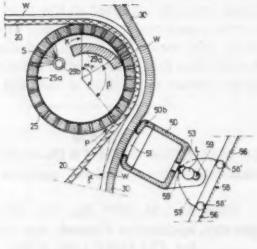


4,113,557

PAPER MANUFACTURING STRUCTURE PARTICULARLY FOR DETACHING A WEB FROM A WIRE

Matti Kankaanpää, Espoo, Finland, assignor to Valmet Oy, Finland

Filed Apr. 14, 1977, Ser. No. 787,334
Claims priority, application Finland, Apr. 14, 1976, 761031
Int. Cl.[2] D21F *1/52*
U.S. Cl. 162—301 **10 Claims**



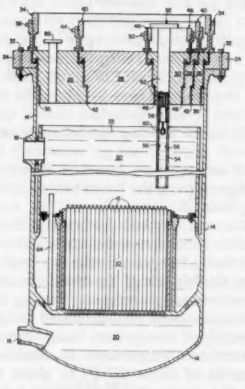
1. In a paper machine, wire means for transporting a web to a detaching location where the web is to be detached from the wire means and transported to a press section, felt means extending up to and beyond said detaching location for receiving the web detached from said wire means at said detaching location and transporting the web to the press section, the web being sandwiched between the wire means and felt means at said detaching location, air-flow means situated adjacent said detaching location for creating a flow of air travelling in a direction through the wire means toward the web and through the web toward the felt means as well as through and beyond the latter, with said air-flow means localizing said flow of air to a relatively narrow rectangular area extending transversely across the wire means, web, and felt means, and guide means situated at said detaching location and engaging said felt means for guiding the latter beyond said detaching location with the web adhering thereto while deflecting the felt means away from the wire means through a relatively small angle which is substantially less than 45°, said means creating said flow of air including a suction box situated in engagement with said felt means at the side thereof opposite from said web and having in engagement with said felt means a wall formed with an elongated slot which defines said localized area for said flow of air and through which air is sucked to flow first through said wire means, then through said web and then through said felt means into said suction box, said wall of said suction box having an exterior convexly curved surface engaging said felt means and forming said guide means, said wall of said suction box being formed with a pair of said slots situated one after the other in the direction of travel of said felt means, and said suction box having in its interior a partition means defining in the interior of said suction box separate chambers which respectively communicate with said slots.

4,113,558

NUCLEAR FUEL HANDLING GRAPPLE CARRIAGE WITH SELF-LUBRICATING BEARING

Elman E. Wade, Ruffsdale, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 7, 1976, Ser. No. 748,352
Int. Cl.[2] G21C *19/20*; F16C *17/00, 1/24*
U.S. Cl. 176—30 **4 Claims**



1. Nuclear fuel handling apparatus including a fuel transfer tube disposed on a closure head of a vessel containing fuel assemblies and extending from said closure head downward into a pool of coolant, tracks attached to the inside of said fuel transfer tube, a grapple carriage disposed in said fuel transfer tube, a grapple attached to the underside of said grapple carriage for engaging said fuel assemblies, a grapple control mechanism disposed on said closure head and attached to said grapple carriage and said grapple for lifting and lowering said grapple carriage and for controlling said grapple, and wheels attached to said grapple carriage for guiding said grapple carriage along said tracks, a bearing for each of said wheels, each of said bearings comprising:

an inner race mounted on an axle;

roller element bearings disposed in said inner race;

an outer race disposed around said inner race and enclosing said roller element bearings between said inner and outer races, said roller element bearings allowing said outer race to rotate relative to said inner race;

alignment means disposed on said axle and adjacent said outer race for maintaining alignment of said outer race

with respect to said inner race while allowing rotation of said outer race;

a reservoir disposed in said axle in fluid communication with said roller element bearings and capable of being filled with coolant when said axle is submerged in said pool of coolant for supplying said coolant to said roller element bearing, thereby lubricating said roller element bearings; and

supply means establishing fluid communication between said reservoir and said roller element bearings for permitting said coolant to flow from said reservoir and between said outer race and said alignment means establishing an outward flow of said coolant thereby preventing impurities from seeping inward.

4,113,559

METHOD OF REMOVING THE DECAY HEAT OF RADIOACTIVE FISSION PRODUCTS

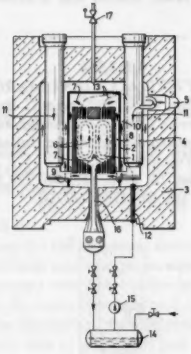
Fritz Schweiger, Kagen, Germany, assignor to Hochtemperatur-Kernkraftwerk GmbH (HKG) Gemeinsames Europaisches Unternehmen, Uentrop/Unna, Germany

Filed Apr. 7, 1976, Ser. No. 674,483

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1975, 2516123

Int. Cl.² G21C 9/00

U.S. Cl. 176—38 **12 Claims**



1. A method of removing the decay heat of radioactive fission products from the core of a helium-cooled graphite-moderated high temperature nuclear reactor using pebble type fuel elements after the fission reaction has been shut down and in an emergency situation wherein a fault or a combination of faults results in the inability of the normal operational systems of the reactor to remove the decay heat satisfactorily, comprising introducing water into the core of said reactor into direct surface contact with the pebble type fuel elements.

4,113,560

CORE CATCHER FOR NUCLEAR REACTOR CORE MELTDOWN CONTAINMENT

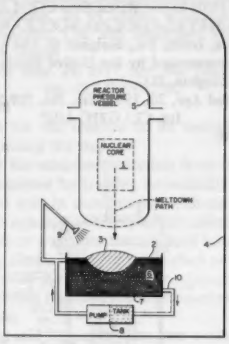
Michael J. Driscoll, Cambridge, Mass., and Frank L. Bowman, Gales Ferry, Conn., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 595,639, Jul. 14, 1975, abandoned, which is a continuation of Ser. No. 412,389, Nov. 2, 1973, abandoned. This application Sep. 15, 1976, Ser. No. 723,403

Int. Cl.² G21C 9/00

U.S. Cl. 176—38 **4 Claims**

1. In a nuclear reactor of the type having a liquid cooled core in a pressure vessel which is in a containment building having an emergency cooling fluid system the combination with a core catcher for the containment of the debris of a nuclear reactor core meltdown comprising, a bed of high thermal conductivity graphite particles placed under said nuclear reactor core pressure vessel, a bin for containing said particles, means for draining said bed of the core cooling fluid



upon meltdown of said core into said bin, means for spraying said debris with said cooling fluid from said bin, means for flooding said bin with said cooling fluid, and said bin being large enough to contain said bed, core debris, and core cooling and emergency fluid.

4,113,561

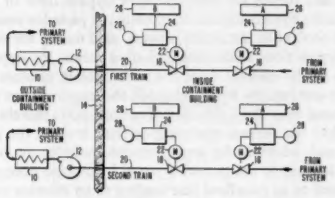
VALVE ARRANGEMENT FOR A NUCLEAR PLANT RESIDUAL HEAT REMOVAL SYSTEM

Gary L. Fidler, Plum Borough; Richard A. Hill, Monroeville, and John P. Carrera, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 17, 1976, Ser. No. 686,858

Int. Cl.² G21C 9/00

U.S. Cl. 176—38 **1 Claim**



1. An improved valve arrangement for an auxiliary residual heat removal system of a nuclear reactor plant, said plant including a first electrical bus, second electrical bus, and a primary reactor coolant system, said primary system disposed within a containment structure, said residual heat removal system having a first circulating fluid train and a second circulating fluid train, each of said trains having piping connecting said primary system, a pump, and a heat exchanger, said pump and heat exchanger disposed outside of said containment, wherein the improvement comprises:

three motor-operated isolation valves disposed along said piping of each said train within said containment downstream of said primary system positioned such that there is a single valve and two parallel-connected valves, one of which parallel valves is normally closed, said single and normally closed valves of said first train being connected to said first electrical bus and the other parallel valve being connected to said second bus, the single and normally closed valves of said second train being connected

to said second electrical bus and the other parallel valve of said second train being connected to said first bus.

4,113,562

APPARATUS FOR CONTROLLING COOLANT LEVEL IN A LIQUID-METAL-COOLED NUCLEAR REACTOR

Robert D. Jones, Irwin, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 20, 1977, Ser. No. 789,154
Int. Cl.[2] G21C *1/02*
U.S. Cl. 176—40 **3 Claims**

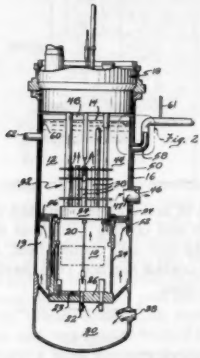


Fig. 2

1. In a liquid-metal-cooled fast-breeder reactor incorporating a core submerged in liquid metal coolant within a pressure vessel, there being an inlet coolant plenum below the core and an outlet coolant plenum above the core, a thermal liner extending from the bottom of the outlet plenum to above the normal operating coolant level in the outlet plenum spaced from the pressure vessel to define a bypass annulus therebetween, and means for establishing a bypass flow of coolant through the bypass annulus to insulate the pressure vessel from the hot coolant in the outlet plenum, said means for establishing a bypass flow of coolant including means for bypassing a portion of the coolant from the inlet coolant plenum around the core and into the bypass annulus, the improvement wherein the thermal liner has a plurality of control ports therein located just below the normal operating coolant level in the pressure vessel and wherein the improvement includes an overflow nozzle located in the pressure vessel below the control ports connected to an overflow line leading to an exterior overflow vessel, said overflow line including a portion at an elevation such that overflow coolant flow is established therethrough when the coolant level in the outlet plenum is above the top of the control ports.

4,113,563

FUEL ARRANGEMENT FOR HIGH TEMPERATURE GAS COOLED REACTOR

Joseph M. Tobin, McMurray, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

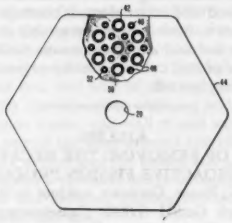
Filed Jan. 6, 1976, Ser. No. 646,812
Int. Cl.[2] G21C *5/00*
U.S. Cl. 176—84 **9 Claims**

1. A fuel arrangement for a high temperature gas cooled nuclear reactor comprising:

(a) a first arrangement of elongated cylindrical first fuel elements comprising primarily fissile nuclear material, said first elements having a concentric cylindrical first coolant passageway therethrough,

(b) a second arrangement of elongated cylindrical second fuel elements comprising primarily fertile nuclear material, said second elements having a concentric cylindrical second coolant passageway therethrough, and

(c) a plurality of elongated moderator blocks having a hexagonal cross section and each comprising cylincrical holes therethrough perpendicular to said cross-section, said holes being spaced from one another and sized to removably receive said first and second fuel elements, each said



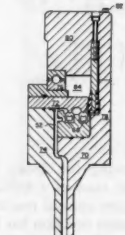
hole receiving only one of said elements, a centrally located control passageway parallel to said holes extending through said block, and means to retain each said fuel element within each respective hole, said means being affixed within said holes at an extremity thereof and having a circular cross section and a concentric opening therethrough.

4,113,564

CORE DISRUPTIVE ACCIDENT MARGIN SEAL

John Garin, Oak Ridge, Tenn., and James C. Belsick, Washington Township, Fayette County, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 13, 1976, Ser. No. 714,220
Int. Cl.[2] G21C *13/06*
U.S. Cl. 176—87 **4 Claims**



1. A nuclear reactor system including a vessel, fuel assemblies positioned therein, an inlet and an outlet for circulating a coolant in heat transfer relationship with said fuel assemblies, and a closure head disposed on said vessel in a fluid tight relationship, said closure head comprising:

seal means disposed in a first annulus defined between a first and a second component of said closure head for sealing said first annulus when actuated while allowing free rotation of said components with respect to each other when not actuated;

actuating means attached to said seal means for drawing said seal means substantially vertically into contact with both said first and said second component for sealing said first annulus.

4,113,565

GLUCOSE ISOMERIZATION WITH IRON ION-THIOL ACTIVATOR ION-GLUCOSE ISOMERASE SYSTEMS

Thomas L. Hurst, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation-in-part of Ser. No. 560,658, Mar. 20, 1975, Pat. No. 4,026,764. This application Dec. 13, 1976, Ser. No. 750,332

Int. Cl.[2] C12D *13/02*

U.S. Cl. 195—31 F **16 Claims**

1. In a method for isomerizing dextrose to fructose with a glucose isomerase in the presence of metal ion activator or co-metal ion activator combinations wherein the metal activator or co-metal ion activators are used to stabilize and activate the glucose isomerase during the isomerizaton of dextrose to fructose in a glucose isomerization reaction, the improvement which comprises isomerizing dextrose to fructose with glucose isomerase by adding to the isomerization reaction a stabilizing and activating amount of water-soluble iron ions and water-soluble thiol activator ions.

4,113,566

PROCESS FOR PREPARING 6-AMINOPENICILLANIC ACID

James J. Hamsher, Gales Ferry, and Merrill Lozanov, East Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,212

Int. Cl.[2] C12D *13/06*

U.S. Cl. 195—36 P **5 Claims**

1. In the process for the enzymatic conversion of a penicillin to 6-aminopenicillanic acid wherein an aqueous solution of said penicillin is contacted with a particulate immobilized penicillin acylase catalyst, the improvement which comprises recirculating said solution through a bed comprising said particulate catalyst at a flow rate of at least0.4 bed volume per minute while maintaining said solution at a temperature of from about 15° and a pH of from about 6.5 to 9.0 and continuing said recirculation until said penicillin is substantially converted to said acid, said bed having a depth of up to about 6 centimeters.

4,113,567

INSOLUBILIZATION OF ENZYMES ON MODIFIED PHENOLIC POLYMERS

Merle S. Masri, Emeryville; Virginia G. Randall, and William L. Stanley, both of El Cerrito, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 712,298, Aug. 6, 1976, abandoned. This application Aug. 25, 1977, Ser. No. 827,659

Int. Cl.[2] C07G *7/02*

U.S. Cl. 195—63 **6 Claims**

1. A process for preparing an insoluble but active enzyme, which consists of

(a) dissolving a soluble active enzyme in water,

(b) mixing the resulting solution with a diazotized phenol-formaldehyde polymer, and

(c) separating the resulting insolubilized enzyme product from the reaction mixture.

4,113,568

PROCESS FOR THE RENEWAL OF AN INSOLUBILIZED GLUCOSE ISOMERASE

Yoshimasa Fujita, Tokyo; Akiyoshi Matsumoto, Hino; Isao Miyachi, Higashiyamato; Nobuo Imai, Higashimurayama; Isao Kawakami, Machida; Tadashi Hishida, Tokyo, and Akira Kamata, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd. and Seikagaku Kogyo Co., Ltd., both of Tokyo, Japan

Filed Mar. 24, 1977, Ser. No. 780,843

Int. Cl.[2] C07G *7/02*

U.S. Cl. 195—68 **15 Claims**

1. A process for the renewal of an insolubilized glucose isomerase comprising the steps of:

(1) desorbing the adsorbed materials from an insolubilized glucose isomerase by treating sequentially with an aqueous mineral acid in combination with an aqueous alkali solution, an aqueous electrolytic salt solution, an aqueous mineral acid or a mixture thereof, said insolubilized isomerase being glucose isomerase adsorbed on and bonded to a supporter of synthetic anion exchange macroporous resin and having been used in the isomerization of glucose into fructose,

(2) converting said supporter resin into a salt type to regenerate the supporter, and

(3) adsorbing fresh glucose isomerase on the regenerated supporter.

4,113,569

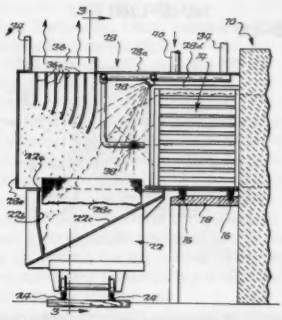
COKE AIR POLLUTION CONTROL METHOD AND APPARATUS

Kevin D. Mahar, Buffalo, N.Y., assignor to Donner-Hanna Coke Corporation, Buffalo, N.Y.

Filed Nov. 28, 1975, Ser. No. 635,594

Int. Cl.[2] C10B *33/00, 39/00*

U.S. Cl. 201—39 **16 Claims**



1. In a coke air pollution control system for a coke oven having a plurality of oven chambers, the combination comprising:

means defining at least one vehicle having a reposing coke receiving cavity, a falling coke admitting opening communicating with said cavity and a self-unloading coke releasing exit communicating with said cavity, and said vehicle being adapted to travel between a coke receiving location and a coke quenching station,

a coke guide having an inlet and adapted to receive an ejected coke mass from any of said coke oven chambers and an outlet and laterally spaced from said coke oven for guiding said ejected coke mass to fall through said coke admitting opening of said vehicle to said coke receiving cavity thereof, and

a hood apparatus disposed above said vehicle means and along the front of said plurality of coke oven chambers, said hood apparatus comprising a top wall, end wall and

oppositely disposed side walls, said end and side walls extending downwardly adjacent to the top of said vehicle and being connected together to envelop said coke guide and at least a portion of said coke admitting opening and coke receiving cavity of said vehicle, said hood being supported to maintain it in a substantially smoketight manner with said coke oven and said vehicle and further including liquid spraying means mounted on the interior surface thereof, supply means for supplying said spraying means with a liquid for the spraying thereof in predetermined quantities toward the mass of coke as it is ejected to thereby create substantially a vapor atmosphere within said hood and to reduce the temperature of the upper layer of reposing coke down to a pre-selected temperature range, said supply means supplying said liquid in quantities insufficient to quench said coke masses but sufficient to create said vapor atmosphere whereby particulate matter within said air space associated with said coke becomes wetted and entrained in said vapor, and an exhaust duct opening in said hood for venting said vapor and particulate matter entrained therein, said exhaust duct opening including means for removing wetted, entrained particulate matter from the vapor flow through said exhaust opening.

4,113,570

RICH-GAS BURNER ARRANGEMENT IN HEATING FLUES FOR COKE OVEN CHAMBERS

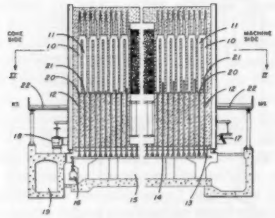
Erich Pries, Bochum, Fed. Rep. of Germany, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Dec. 3, 1976, Ser. No. 747,381

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1975, 2557084

Int. Cl.² C10B 5/02

U.S. Cl. 202—139 **3 Claims**



1. In a battery of coke ovens including coke oven chambers which decrease in width along their length from the coke side to the pusher side of the coke ovens, said coke oven chambers including individual heating walls and vertical heating flues formed by flue walls arranged to subdivide the space between heating walls of adjacent coke oven chambers, the combination therewith comprising rich-gas burners extending vertically from the flue soles along said vertical heating flues, said rich-gas burners being alternate flues and extending to progressively increasing elevations above the flue soles such that the rich-gas burner exit zones increase in height from burner-to-burner in heating flues between the heating walls for adjacent coke oven chambers, the flue soles within each row of heating flues being located on the same horizontal plane, said rich-gas burners extending to the greatest elevational height at the pusher side of each coke oven chamber for optimum heat consumption by a charge of coking coal through uniform heating thereof within the coke oven chambers along the decreasing width thereof.

4,113,571

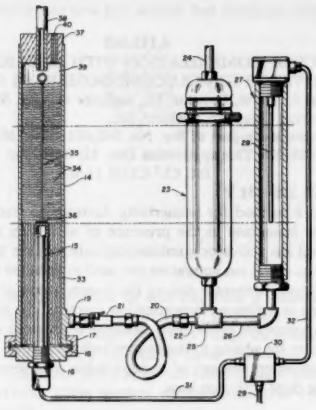
WATER DISTILLER OF BOILER-CONDENSER TYPE

Nils Nygards, 7435 Hwy. 65 NE, Minneapolis, Minn. 55432

Filed Feb. 25, 1976, Ser. No. 661,252

Int. Cl.² B01D 3/02

U.S. Cl. 202—176 **13 Claims**



1. A water distiller comprising an upright elongated boiler tube, an electric heating member extending upwardly within said tube, means for connecting said member with a source of electric current for heating the same, a wire screen heat transmitter surrounding said member in close fitting relation to transfer heat rapidly therefrom and transmit same to surrounding water and to minimize turbulence in such water as distillation proceeds, means for introducing water into said tube to maintain a supply thereof therewithin around said screen and heating member as distillation proceeds, and means connected with said boiler tube and receiving water vapor therefrom for condensing and for collecting same.

4,113,572

POLLUTION CONTROL SYSTEM INCLUDING A ONE-SPOT QUENCH-CAR FOR COKE PRODUCING INSTALLATIONS

John G. Manda, Florissant, Mo.; Joe D. Burroughs, O'Fallon, Ill., and Donald F. Cairns, Webster Groves, Mo., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed Jan. 9, 1976, Ser. No. 647,937

Int. Cl.² C10B 33/00, 39/14, 27/00

U.S. Cl. 202—227 **18 Claims**

1. For use in combination with a coking installation including a horizontally arranged battery of coke ovens and a coke guide mounted on a guide car for movement along a path in front of the battery and into a pushing position in alignment with the respective coke ovens for guiding coke pushed therefrom to a hot coke transfer car movable on rails parallel to the path of the guide car and outwardly spaced therefrom, with the transfer car being positioned in alignment with the oven and guide car during the pushing operation and movable along the rails to a quenching station spaced from the ovens, an improved one-spot hot coke transfer and quenching car comprising,

a generally rectangular receptacle for receiving and containing a full charge of hot coke from a coke oven,

said receptacle having a flat, generally horizontal bottom wall, upwardly extending side walls and end walls, and a top closure means,

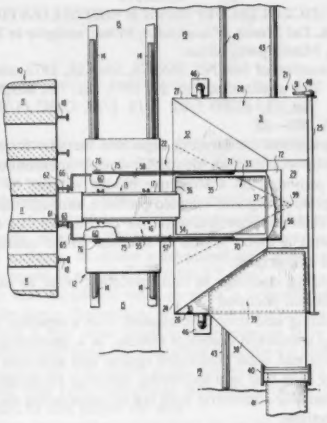
means forming a generally rectangular coke receiving opening in the top closure means, said side walls being longer than said end walls and extending transverse to the posi-

tion of a plurality of coke ovens when the car is positioned to receive coke pushed from the ovens,

said coke receiving opening being located centrally between said end walls and extending transversely of the receptacle from a point adjacent the side wall thereof closest to an oven during the pushing operation,

coke distributing means mounted in said receptacle beneath said coke receiving opening,

said coke distributing means having upwardly directed deflector surface means including an apex extending in the general direction of pushing coke from an oven and located centrally within the receptacle beneath said opening to engage and divide coke falling from the coke guide through said coke receiving opening and to impart thereto a horizontal component of motion in a general direction toward said end walls to substantially evenly distribute the coke throughout said receptacle with said transfer car remaining stationary throughout the entire pushing operation.

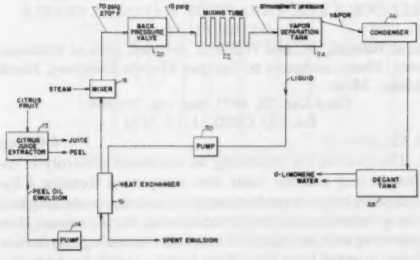


said coke receiving opening being adapted to receive coke quenching means therethrough to permit coke contained in the receptacle to be quenched therein at a quenching station.

4,113,573
METHOD OF AND APPARATUS FOR STEAM STRIPPING IMMISCIBLE MATERIALS

Gordon P. Gerow, Davenport, Fla., assignor to FMC Corporation, San Jose, Calif.

Filed Sep. 20, 1973, Ser. No. 399,238
Int. Cl.[2] B01D *3/42, 3/38*
U.S. Cl. 203—2 **13 Claims**



1. In a process for steam stripping a volatile constituent from a liquid mixture of immiscible materials, the steps of injecting steam into said liquid mixture while flowing, heating said mixture while under superatmospheric pressure and in a flowing condition by said injection of steam therein, the pressure and temperature of said mixture and ad-mixed steam material being such that said steam is converted to and maintained substantially entirely in a liquid phase, substantially and abruptly reducing the superatmospheric pressure of said material to rapidly vaporize said steam component, immediately thereafter conducting the mixture and ad-mixed steam material through a relatively long turbulent passage while simultaneously further reducing the pressure to provide heat for further vaporizing the steam and said volatile constituent of said mixture, separating the vapors from the remaining liquid after the material has passed through said passage, condensing said vapors to obtain a condensate, and separating said volatile constituent from the water in said condensate.

4,113,574
ACRYLIC POLYMERIZATION INHIBITION

Ignatius Schumacher, Webster Groves, Mo., and James E. White, Coshocton, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 22, 1976, Ser. No. 734,893
Int. Cl.[2] B01D *3/34;* **C07C** *57/04, 69/54*
U.S. Cl. 203—8 **4 Claims**

1. In a process wherein a mixture comprising a monomer selected from the group consisting essentially of acrylate esters, methacrylate esters, acrylic acid, methacrylic acid and mixtures thereof is vaporized, and a portion of the mixture is condensed, the improvement which comprises adding a polymerization inhibiting amount of 2,4-pentanedione to the mixture before it is vaporized.

4,113,575
SEPARATION OF ACETONE FROM N-BUTANE BY DISTILLATION

Glenn H. Dale, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 23, 1976, Ser. No. 669,539
Int. Cl.[2] B01D *3/40;* **C07C** *49/08, 9/10*
U.S. Cl. 203—62 **6 Claims**

1. A process for separating a mixture consisting essentially of acetone and n-butane which mixture forms an azeotrope under conventional distillation conditions which comprises:

(a) introducing the mixture into a fractionation zone and therein subjecting said mixture to fractional distillation conditions including pressures up to about 60 psia (0.414 MPa) and a corresponding temperature so that an azeotrope is not formed but the mixture is separated into an overhead containing substantially n-butane and a bottoms containing mainly acetone; and

(b) withdrawing an overhead stream containing essentially n-butane and being essentially free of acetone and a bottoms stream containing essentially acetone.

4,113,576
METHOD OF MAKING A THIN-COPPER FOIL-CARRIER COMPOSITE

Irving J. Hutkin, c/o Califoil, Inc. 7955 Arjons Dr., San Diego, Calif. 92126

Filed Jun. 17, 1976, Ser. No. 697,045
Int. Cl.[2] C25D *1/04, 1/20*
U.S. Cl. 204—13 **19 Claims**

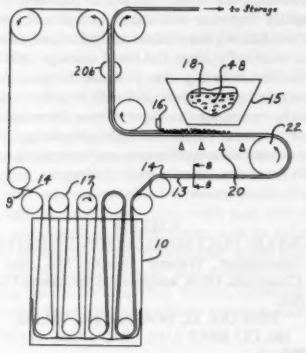
1. An improved method of making a thin copper foil-plastic composite, said method comprising:

a. forming a thin copper foil on a permanent metallic surface, said foil having an exposed side opposite the side thereof which contacts said metallic surface;

b. contacting only said exposed foil side, while said foil is still on said surface, with a plurality of fusible solid plastic

particles and depositing said particles only on said exposed side;

c. coalescing said plastic particles into a unitary foil-plastic composite sheet while preventing bleed-through of said plastic through any pinholes in said foil to said metallic surface; and



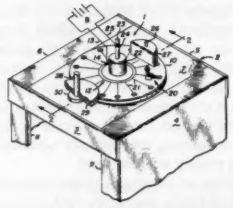
d. readily removing said composite from said metallic surface without rupturing said foil and without plastic buildup on said metallic surface, whereby the side of the foil which contacted the metallic surface is substantially free of any of said plastic.

4,113,577

METHOD FOR PLATING SEMICONDUCTOR CHIP HEADERS

John P. Ross, Cupertino, and Carl E. Bernardi, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 619,368, Oct. 3, 1975, Pat. No. 4,032,422.
This application Mar. 10, 1977, Ser. No. 776,162
Int. Cl.² C25D *5/08*
U.S. Cl. 204—15 **3 Claims**



1. A method of plating the die-attach area of a plurality of semiconductor chip headers comprising the steps of:

placing each of said headers in an inverted position against a sealing member in a cavity of a rotating disc assembly;

clamping said headers against said sealing member such that said sealing member forms a fluid-tight seal about said die-attach area;

jetting a plating solution containing a plating material against said exposed areas; and

causing a current to flow through said headers while said solution is being jetted against said exposed areas whereby plating material in said solution adheres to said exposed area; wherein said step of jetting comprises the step of jetting said solution against said die-attach area after said clamping of said headers and further wherein said step of causing a current to flow comprises the step of coupling a source of potential between a means for clamping said headers and a means for jetting said fluid against said die-attach areas such that said current will flow when said headers are contacted by said clamping means and said plating solution is flowing between said jetting means and said die-attach areas.

4,113,578

MICROCIRCUIT DEVICE METALLIZATION

Louis A. Del Monte, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 365,778, May 31, 1973, abandoned.
This application Jun. 27, 1977, Ser. No. 809,960
Int. Cl.² C25D *5/02, 7/12, 5/54;* C23C *15/00*
U.S. Cl. 204—15 **18 Claims**

1. A method for forming deposited metallic formations on selected portions of an electronic device interconnection network, provided on a structure having a layer of insulating material covering said selected portions, through using a sputtering chamber provided with one or more source electrodes each with a metal which is selected to be sputtered, said method comprising:

providing openings in said insulating layer to expose said selected portions;

providing said structure, masked with a separate mask having sputtering openings therein, in a sputtering chamber with said mask positioned against said structure in a manner such that said sputtering openings are positioned substantially concentric with the corresponding said selected portions;

providing a low pressure gas atmosphere in said chamber;

sputtering each said metal through said sputtering openings in a selected order for a time sufficient to obtain, through said sputtering openings, a selected amount of each of said metals;

removing said mask to leave a structure resultant surface;

providing a metal flash layer on said structure resultant surface;

providing a photoresist layer on said metal flash layer, said photoresist layer having plating openings therein which are substantially concentric with said selected portions; and

electroplating a plated metal layer through said plating openings onto said metal flash layer where provided on said metals as sputtered.

4,113,579

PROCESS FOR PRODUCING AN ALUMINUM ELECTROLYTIC CAPACITOR HAVING A STABLE OXIDE FILM

John J. Randall, Jr., and Walter J. Bernard, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Apr. 28, 1977, Ser. No. 791,656
Int. Cl.² C25D *11/12, 5/44*
U.S. Cl. 204—33 **6 Claims**

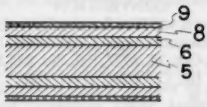
1. The process for producing an aluminum electrolytic capacitor having a stable oxide film comprising forming a hydrated oxide layer on an aluminum foil, and then anodizing said foil in a formation electrolyte containing borate anions, then depolarizing said anodized foil in a bath containing a hydration inhibitor selected from phosphate, borate, and alpha- or ortho-hydroxy carboxylic acid anions, the pH of said bath being between 2 and 7, and then reanodizing said foil.

4,113,580

STEEL SHEET USEFUL IN FORMING FOODSTUFF AND BEVERAGE CANS

Nobuyuki Tsutsui, Kudamatsu; Tsuneo Inui, Tokuyama, and Hiroaki Kawamura, Kudamatsu, all of Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1977, Ser. No. 818,099
Claims priority, application Japan, Aug. 18, 1976, 51-97739
Int. Cl.[2] C25D 5/50, 5/10
U.S. Cl. 204—37 T 11 Claims



1. A process for producing a steel sheet containing a first layer of an iron-tin alloy and a second layer of hydrated chromium oxide which comprises

electrolytically tin plating a substantially clean steel sheet base in an electrolyte containing stannous sulfate, stannous chloride, stannous fluoborate, sodium stannate or potassium stannate, to obtain a tin-plated steel sheet in which the amount of plated tin is 0.05–1.5 g/m^2,

heating said tin-plated steel sheet at a temperature sufficiently above the melting point of tin for a time sufficient to form a first layer containing an iron-tin alloy on the surface of said base, the amount of said iron-tin alloy being 0.05–1.0 g/m^2, calculated as tin, the amount of any free tin in said first layer being less than one-third of the total amount of said plated tin, and

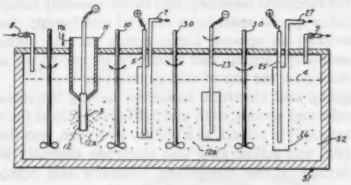
subjecting the resultant steel sheet to an electrolytic treatment at 5–20 coulombs/dm^2 in an electrolyte containing chromic acid and at least one additive selected from the group consisting of sulfuric acid, a fluorine compound, an aromatic disulfonic acid and thiourea, to form a second layer consisting essentially of hydrated chromium oxide in an amount of 0.005–0.05 g/m^2, calculated as chromium, any metallic chromium deposited between said first and second layers being present in an amount less than 0.005 g/m^2.

4,113,581

ELECTRODEPOSITION PROCESS

Shin-Ichi Tokumoto; Eiji Tanaka, both of Yokohama; Tatsuo Kikuchi, Hoya; Kenji Ogisu, Yokohama, and Toshiro Tsumori, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 31, 1977, Ser. No. 801,640
Claims priority, application Japan, Jun. 4, 1976, 51-65920
Int. Cl.[2] C25D 3/66
U.S. Cl. 204—39 10 Claims



1. An electrodeposition process comprising the steps of:

(a) preparing a fused salt electrolytic bath containing a salt of a desired metal or salts of the constituent metals of a desired alloy;

(b) providing a main cathode in said bath for electrodeposition of a metal or alloy thereon from said bath;

(c) providing an auxiliary cathode in spaced relationship from said main electrode within said bath;

(d) growing a deposit of the desired metal or alloy on said auxiliary cathode, mechanically removing the deposited metal or alloy from said auxiliary cathode to produce solid particles, and dispersing such solid particles in said bath; and

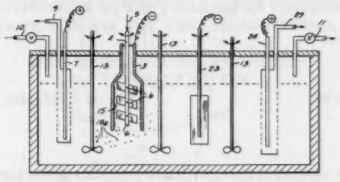
(e) electrodepositing the desired metal or alloy on said main cathode from said bath containing dispersed solid particles therein.

4,113,582

METHOD OF ADJUSTING A FUSED SALT ELECTROLYTIC BATH

Shin-ichi Tokumoto; Eiji Tanaka, both of Yokohama; Tatsuo Kikuchi, Hoya; Kenji Ogisu, Yokohama, and Toshiro Tsumori, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 1, 1977, Ser. No. 802,487
Claims priority, application Japan, Jun. 4, 1976, 51-65921
Int. Cl.[2] C25D 3/66
U.S. Cl. 204—39 12 Claims



1. An electrodeposition process comprising the steps of:

(a) preparing a fused salt electrolytic bath containing at least alkali and alkaline earth metal chloride salts therein;

(b) providing at least operational first and second cathode electrodes and at least one operational anode electrode within said bath;

(c) adding a higher valency salt of a metal to be deposited from said bath or higher valency salts of constituent metals of an alloy to be deposited from said bath to said bath;

(d) reducing said higher valency salt into a lower valency salt on said first cathode;

(e) removing said lower valency salt from said first cathode and dispersing said lower valency salt within said bath; and

(f) electrodepositing the metal or alloy from said bath onto said second cathode.

4,113,583

METHOD FOR BRIGHTENING THE ELECTRODEPOSITS OF ZINC FROM ALKALINE ZINC ELECTROPLATING BATHS

Kathuhide Oshima, Tokyo; Haruyuki Takasaki, Ichihara, and Akio Takahashi, Kisarazu, all of Japan, assignors to Dipsol Chemical Company, Ltd., Tokyo, Japan

Filed Mar. 21, 1977, Ser. No. 779,560
Claims priority, application Japan, Apr. 27, 1976, 51-47162
Int. Cl.[2] C25D 3/22, 3/24
U.S. Cl. 204—55 Y 6 Claims

1. A method for the electrodeposition of bright zinc which comprises electrodepositing zinc from an aqueous alkaline zinc electroplating bath comprising a water soluble compound prepared by reacting an imidazole compound which is imidazole and/or at least one substituted imidazole with at least one organic compound selected from the group consisting of monochloroacetic acid, benzyl chloride, chloroacetamide, 3-aminobenzyl chloride, dichloroglycerine, methyl iodide, allyl chloride, dichloroethane, and monochloropropane,

which quaternizes nitrogen in said imidazole compound in the presence of water.

4,113,584

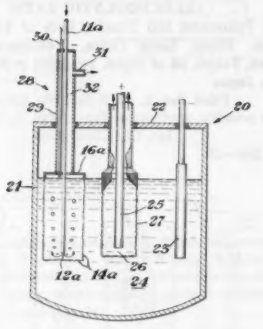
METHOD TO PRODUCE MULTIVALENT METALS FROM FUSED BATH AND METAL ELECTROWINNING FEED CATHODE APPARATUS

David R. Johnson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 517,568, Oct. 24, 1974, abandoned. This application Sep. 13, 1976, Ser. No. 722,851

Int. Cl.² C25C *3/00*

U.S. Cl. 204—64 R **23 Claims**



17. A method to electrolytically produce a multivalent metal from a compound of the metal in a fused halide electrolyte in an electrolytic cell comprising:

(a) feeding the multivalent metal compound to a feed cathode including a multivalent metal compound feed conduit with at least one outlet to pass the metal compound therethrough from a metal compound source to the electrolyte, a member surrounding and substantially entirely enclosing at least the outlet of the conduit, the member being at least partially formed of an electrically conductive foraminous body;

(b) impressing a negative electric potential on the foraminous body to at least partially reduce multivalent metal ions from the compound from a higher valence to a lower valence;

(c) impressing an electric potential between an anode and a deposition cathode in the electrolytic cell to release a halogen at the anode and to deposit the multivalent metal at the deposition cathode.

4,113,585

METHOD AND APPARATUS FOR ELECTROLYSIS OF ALKALI OR ALKALINE EARTH METAL HALIDE

Paul Raphael Resnick, Wilmington, Del., and Walther Gustav Grot, Chadds Ford, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 623,920, Oct. 20, 1975, which is a continuation-in-part of Ser. No. 406,361, Oct. 15, 1973, abandoned. This application Sep. 21, 1977, Ser. No. 835,804

Int. Cl.² C25B *1/16, 13/08*

U.S. Cl. 204—98 **27 Claims**

1. In a process of production of halogen and metal hydroxide of an alkali, alkaline earth metal, or combinations thereof, by electrolysis of a halide of said metal employing separate anode and cathode sections in an electrolytic cell, the improvement comprising passing ions of said metal through a film comprising a fluorine-containing polymer containing pendant side chains with sulfonyl groups attached to a carbon atom having at least one fluorine atom connected thereto, at least 40% of the sulfonyl groups in a first layer of said film in a thickness of at least 200 angstroms present as ion exchange sites of a salt of said metal of N-monosubstituted sulfonamido groups formed through reaction of a primary amine and at least a majority of the sulfonyl groups in a second layer of said film present as ion exchange sites in ionic form, said first layer facing the cathode portion of the cell.

4,113,586

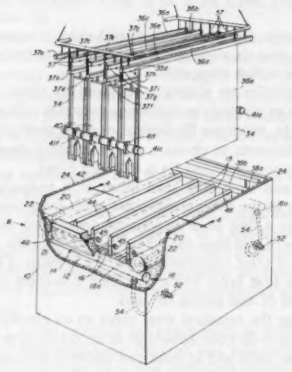
METHOD AND APPARATUS FOR THE ELECTROLYTIC RECOVERY OF METAL EMPLOYING ELECTROLYTE CONVECTION

Glenn Cook, Harvard, and Paul Larson, Peabody, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 845,128

Int. Cl.² C25C *1/00, 7/00*

U.S. Cl. 204—105 R **22 Claims**



15. A method of performing electrodeposition at a high ratio of current density to metal ion concentration in a cell which includes anodes, cathodes, and an electrolyte with the attendant production of high quality metal which can be easily stripped from the cathodes, comprising the steps of:

positioning non-conductive convection edge baffles adjacent to opposite edges of the anode faces so as to extend toward the cathode faces,

providing cathodes that extend downwardly to a level below the bottom edge of the anodes, and that are wider than the anodes so that the edges of the cathodes extend outwardly beyond the convection edge baffles,

assembling said cathodes, anodes, and edge baffles to form an electrode assembly of spaced apart, interleaved cathodes and anodes, whereby said opposed anode and cathode faces are spaced apart from each other at a distance of less than about two inches,

providing a bottom baffle assembly to mate and align with the electrode assembly, said baffle assembly having bubble tubes spaced apart in an integral relationship thereto,

providing an upward force, acting on said bottom baffle assembly, urging said assembly to rise to an alignment state near the top of said electrolyte,

aligning said electrode assembly, having interleaved cathodes and anodes, with said baffle assembly as the electrode assembly is placed, as a unitary structure, into the electrolyte, and submerging said electrode assembly below the surface of the electrolyte, whereby said bottom baffle assembly is submerged, the bubble tubes are positionally aligned with non-conductive anode extensions and the cathode faces, and the non-conductive anode bottom extensions are positioned beneath the anodes,

supplying gas to said bubble tubes through at least one flexible conduit, and

electrodepositing metal on the cathodes while generating

sheets of gas bubbles from the bubble tubes, each sheet passing through the electrolyte between opposed anode-cathode faces to produce agitation of the electrolyte over the cathode faces as metal is being deposited thereon and maintaining the convection edge baffles during electrodeposition to form enclosures between the anode and cathode faces to minimize lateral spreading and contraction of the sheets of bubbles and to prevent deposition of metal at edges of the cathodes extending beyond the baffles, and preventing electrodeposition on the bottom of the cathode faces by the combination of the submerged length of the cathodes and the anode bottom extensions.

4,113,587

METHOD FOR ELECTROCHEMICAL MACHINING

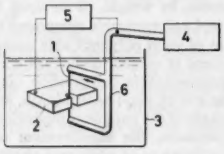
Kunio Chikamori, Tokyo, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Continuation of Ser. No. 602,135, Aug. 5, 1975, abandoned. This application Sep. 12, 1977, Ser. No. 833,862

Claims priority, application Japan, Aug. 5, 1974, 49-89723

Int. Cl.[2] B23P *1/00*

U.S. Cl. 204—129.1 **5 Claims**



1. In a method for electrochemical machining wherein desired machining of a work blank is effected by having said work blank and a cathode disposed opposite each other across a gap in an electrolyte and supplying an electric current to flow between said work blank and said cathode at an anode current density of 30 to 300 A/cm^2, the improvement which comprises supplying a pulsating electric current having a pulse width of 0.01 ms to 10 ms and a duty factor of not more than 0.5 to flow between the work blank and the cathode while said electrolyte is moved only by gas generated in the electrolyte by the pulsating electric current.

4,113,588

PROCESS FOR RECOVERY OF WASTE H_2SO_4 AND HCL

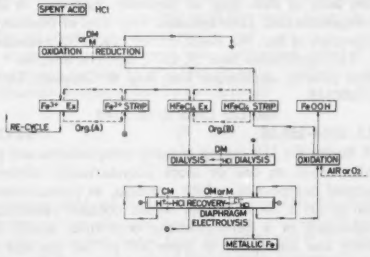
Morio Watanabe, Amagasaki, and Sanji Nishimura, Kyoto, both of Japan, assignors to Solex Research Corporation of Japan, Osaka, Japan

Filed Mar. 2, 1977, Ser. No. 773,657

Claims priority, application Japan, Mar. 9, 1976, 51/25223; Mar. 25, 1976, 51/33029; Oct. 4, 1976, 51/118598

Int. Cl.[2] C25B *1/22*

U.S. Cl. 204—151 **29 Claims**



1. A process for the recovery of waste H_2SO_4 and HCl from aqueous metal pickling solutions which contain large amounts of Fe ions comprising:

1. converting the Fe^{2+} ions in the waste to Fe^{3+} ions in an oxidation reduction cell wherein the waste solution is the anolyte and the catholyte is an HCl solution containing Fe^{3+} ions, the used catholyte thus containing Fe^{2+} ions;
2. extracting the Fe^{3+} ions from the anolyte from step (1) with an organic solvent A to recover the HCl or H_2SO_4;
3. stripping the Fe^{3+} ions from the used solvent A by contacting it with an HCl containing stripping solution and thus regenerating solvent A for reuse;
4. recovering the Fe^{3+} ions from the HCl stripping solution by liquid-liquid extraction thereof with an organic solvent B to form an $FeCl_3$-complex therein;
5. regenerating solvent B by contacting it with an aqueous extractant to extract the $FeCl_3$ therefrom and using the Fe^{3+} containing extractant as the catholyte in step (1);
6. recovering the iron values in the used catholyte from step (1) by diaphragm electrolysis; and
7. regnerating the HCl strip solution from step (4) by subjecting to the diaphragm electrolysis of step (6).

4,113,589

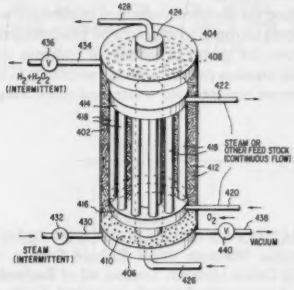
HIGH INTENSITY ENERGY TRANSFER TECHNIQUE

Sam L. Leach, P.O. Box 2536, Palos Verdes Peninsula, Calif. 90272

Filed Apr. 25, 1977, Ser. No. 790,320

Int. Cl.[2] B01J *1/00, 1/10*

U.S. Cl. 204—157.1 R **24 Claims**



16. A method of reactively generating hydrogen and/or hydrogen peroxide from water vapor where the water vapor has a predetermined absorption versus frequency characteristic, comprising the steps of:

a. providing heat sink material comprising a metal or oxide thereof capable of displacing hydrogen from water vapor to form an oxide of said metal at a higher oxidation number exothermically with the production of a predetermined amount of heat; said metal oxide of higher oxidation number being capable of dissociation or disproportionation spontaneously to release oxygen at a predetermined dissociation temperature in the absence of free oxygen, with heat input less than said predetermined amount of heat;
b. heating said heat sink material to a temperature at which it will displace hydrogen from water vapor;
c. providing sensitizer material located in proximity to said heat sink material, said sensitizer material having an energy output characteristic when in the excited state which corresponds to at least one energy absorption region of said water vapor;
d. providing host material associated with said sensitizer material for absorbing energy from said heat sink material and for exciting said sensitizer;

e. passing water vapor over said heat sink material and in the immediate vicinity of said sensitizer and host material whereby said metal oxide of higher oxidation number and hydrogen are formed exothermically; and whereby the broad radiation versus frequency spectrum of said heat sink material is concentrated and applied to said water vapor in the absorption band or bands of said water vapor, to break up the water vapor molecule and form hydrogen and/or hydrogen peroxide;

f. removing said hydrogen and/or hydrogen peroxide;

g. dissociating oxygen from said metal oxide of higher oxidation number by removing free oxygen from the vicinity of said heat sink material with said heat sink material being at a temperature above said predetermined dissociation temperature, to thereby form said metal or oxide thereof and oxygen;

h. removing said oxygen continuously during the dissociation step (g); and

i. repeating steps (e), (f), (g), and (h).

4,113,590
PHOTOREDUCTION OF NITROGEN

Gerhard N. Schrauzer, and Ted D. Guth, both of La Jolla, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jul. 5, 1977, Ser. No. 812,478
Int. Cl.² B01J *1/10*
U.S. Cl. 204—157.1 R **16 Claims**

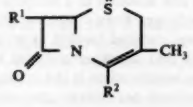
1. A method for the photoreduction of nitrogen which comprises reducing nitrogen to ammonia by irradiating metal oxide selected from the group consisting of titanium dioxide and metal-doped titanium dioxide with ultraviolet light in the presence of gaseous nitrogen and water, and recovering such ammonia.

4,113,591
PREPARATION OF CEPHALOSPORIN COMPOUNDS

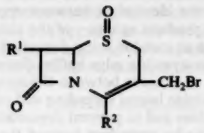
Brian Laundon, Northolt; Brian Richard Cowley, Greenford, and David Cedric Humber, London, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation of Ser. No. 593,273, Jul. 7, 1975, abandoned, which is a continuation of Ser. No. 455,073, Mar. 27, 1974, abandoned, which is a continuation of Ser. No. 306,308, Nov. 14, 1972, abandoned, which is a division of Ser. No. 66,128, Aug. 21, 1970, abandoned. This application Dec. 10, 1976, Ser. No. 749,300
Claims priority, application United Kingdom, Aug. 26, 1969, 42502/69; Mar. 26, 1970, 14980/70; Jan. 23, 1970, 3463/70; Jul. 10, 1970, 33698/70
Int. Cl.² B01J *1/10*
U.S. Cl. 204—158 HA **4 Claims**

1. A process which comprises reacting in the presence of irradiation by ultraviolet, visible light or γ-rays a compound of the formula


(I)

wherein R^1 is phenylacetamido or phenoxyacetamido and R^2 is carboxy or blocked carboxy with a brominating agent to produce a compound of the formula


(II)

wherein R^1 and R^2 are as defined for formula (I).

4,113,592
TRIHALOGENATED HYDROCARBONS AS CO-PHOTOINITIATORS

Charles B. Rybny, Clifton; John C. Trebellas, Berkeley Heights, both of N.J., and Donald E. Sargent, Greenfield Center, N.Y., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 568,216
Int. Cl.² C08F *8/00, 2/46*
U.S. Cl. 204—159.16 **11 Claims**

1. In an ultraviolet curable titanium dioxide pigmented protective coating composition, said coating based on the total weight of the curable composition, containing about 40 to about 100 percent, by weight, of an alpha beta ethylenically unsaturated vinyl polymerizable compound containing at least about two sites of vinyl polymerizable unsaturation, about 60 to about 0 percent of another alpha beta ethylenically unsaturated vinyl polymerizable composition containing no more than about one site of vinyl unsaturation, and up to about 15 percent, by weight of the curable composition, of an ultraviolet organo photoinitiator, the improvement of which consists essentially of utilizing as an additional photoinitiator about 25 to about 200 weight percent, based upon the standard photoinitiator, of a terminal trihalogen compound having the general formula

wherein X is bromine, chlorine, or iodine, or mixtures thereof, A is bromine, chlorine, or iodine, a C_1–C_{12} hydrocarbon radical, a C_1–C_{12} halogenated hydrocarbon, or a C_1–C_{12} amine, carboxylic acid, alcohol, ketone, or aldehyde, and when X is iodine, A may, in addition, by hydrogen, wherein the A substituents are not interferingly reactive with the ultraviolet cure mechanism, and exposing the photoinitiator-containing coating to ultraviolet light at a power of about 200 watts for up to about 1 minute/linear foot.

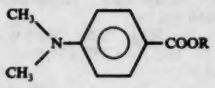
4,113,593
BENZOPHENONE-CONTAINING PHOTOPOLYMERIZABLE BINDERS FOR PRINTING INKS AND COATING COMPOSITIONS

Helmut Barzynski, Bad Durkheim, and Guenter Heil, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 634,877, Nov. 24, 1975, abandoned. This application Sep. 19, 1977, Ser. No. 834,796
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1974, 2458345
Int. Cl.² C08F *8/18, 2/46*
U.S. Cl. 204—159.15 **14 Claims**

1. A binder for UV-curing coating compositions and printing inks, based on one or more polymerizable olefinically unsaturated compounds, which contains, as photoinitiator, a mixture of (a) a photoinitiator which consists essentially of benzophenone or a benzophenone derivative which has a relatively low absorption at from 300 to 380 nm and (b) a photosensitizer which has a stronger absorption in the same wavelength range, wherein the sensitizer (b) consists essen-

tially of p-dimethylaminobenzaldehyde or an ester of p-dimethylaminobenzoic acid of the formula



where R is alkyl of 1 to 12 carbon atoms, aryl of 6 to 14 carbon atoms or cycloalkyl or aralkyl of 15 to 40 carbon atoms and a second p-diemthylaminobenzoate group may be present in R.

4,113,594

POLY(TETRAMETHYLENETEREPHTHALATE) CROSSLINKED BY IRRADIATION

David Dolph Nyberg, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 702,202, Jul. 2, 1976, Pat. No. 4,073,830, which is a continuation-in-part of Ser. No. 405,522, Oct. 11, 1973, Pat. No. 3,968,015. This application Dec. 1, 1977, Ser. No. 856,500

Int. Cl.[2] C08F 8/00; C08G 18/00

U.S. Cl. 204—159.15 6 Claims

1. A process for crosslinking poly(tetramethyleneterephthalate) comprising subjecting poly(tetramethyleneterephthalate) containing at least one part by weight of triallyl cyanurate per 100 parts by weight of polymer to irradiation with ionizing radiation to a dose of from about 2 to about 80 megarads and to a heating step wherein said heat may be applied during or after irradiation.

4,113,595

PROCESS FOR PRODUCING MOLDED PRODUCT COMPOSED OF CROSSLINKED RESIN OR CROSSLINKED-RESIN COATED MATERIAL ON A SUBSTRATE BY MEANS OF ELECTRON BEAM

Miyuki Hagiwara, Maebashi; Kunio Araki, Takasaki; Shingo Matsuoka, Tokai, and Syunichi Fujimura, Hiratsuka, all of Japan, assignors to Japan Atomic Energy Research Institute and The Furukawa Electric Company Limited, both of Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,066

Claims priority, application Japan, Dec. 11, 1974, 49-142272

Int. Cl.[2] C08F 8/00

U.S. Cl. 204—159.17 13 Claims

1. A process for preventing Lichtenberg breakdown in the production of a molded product by irradiating a polyolefin resin with an electron beam comprising forming a blend consisting essentially of

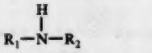
(1) a polyolefin-resin,

(2) a compound represented by the formula

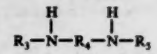
X—Ym

wherein X is a group not containing an acetylenic linkage, Y is a group containing an acetylenic linkage, and *m* is an integer of 1 or more, which is compatible with the resin at a room temperature or an elevated temperature, and

(3) an aromatic secondary amino compound selected from the group consisting of (a) an aromatic secondary amino compound represented by the formula



wherein each of R_1 and R_2 is independently aliphatic hydrocarbon, alicyclic hydrocarbon, or aromatic hydrocarbon provided that at least one of R_1 and R_2 is aromatic hydrocarbon, and each of the aliphatic hydrocarbon, the alicyclic hydrocarbon and the aromatic hydrocarbon may be substituted with hydroxy, methoxy, nitrile, chloro, bromo or fluoro; (b) an aromatic secondary amino compound represented by the formula



wherein each of R_3, R_4 and R_5 is independently aliphatic hydrocarbon, alicyclic hydrocarbon, or aromatic hydrocarbon, provided that at least one of R_3, R_4 and R_5 is aromatic hydrocarbon, and each of the aliphatic hydrocarbon, the alicyclic hydrocarbon and the aromatic hydrocarbon may be substituted with hydroxy, methoxy, nitrile, chloro, bromo or fluoro; and (c) a mixture thereof which is compatible with the resin at room temperature or at an elevated temperature the amount of the aromatic secondary amino compound being sufficient to prevent Lichtenberg breakdown of the resin; molding said blend or coating a substrate with said blend, and irradiating the resulting molded material or the resulting coated material with an electron beam.

4,113,596

METHOD OF MEASURING THE MOBILITY OF COLLOIDS IN AN ELECTRICAL FIELD

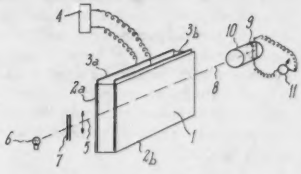
Pierre Albert Eugéne Treille, Saint Cloud; Jacques Claude Antoine Moles, Nanterre; Maurice Gabriel Ernst Bonnemay, Boulogne; Jean Paul Royon, La Varenne-St. Hilaire; Michel Marc Levart, Issay-les-Moulineaux; Henri Pierre Gaessler, Aubervilliers, and Yves Robert Richard, Marly-le-Roi, all of France, assignors to Degremont, Rueil-Malmaison, France

Filed Aug. 19, 1975, Ser. No. 605,926

Claims priority, application France, Sep. 6, 1974, 74 30259

Int. Cl.[2] G01N 27/26, 27/28

U.S. Cl. 204—180 R 12 Claims



1. A method for determining an optimum dosage of a coagulant to be added to a liquid to be treated and having colloidal particles suspended therein, to achieve optimum clarification of the liquid, said method comprising:

providing a tank having at two opposite walls thereof substantially parallelly spaced electrodes;

performing a plurality of density change measuring operations, each such density change measuring operation comprising:

placing a quantity of liquid to be treated within said tank;

adding a predetermined dosage of coagulant material to said liquid to thereby cause floculation of colloidal particles within said liquid;

passing a flat beam of radiation completely longitudinally through said liquid in said tank at a position closely adjacent one of said electrodes and spaced from the other of said electrodes, while maintaining said beam of radiation parallel to said electrodes;

measuring the intensity of said beam of radiation after passage thereof through said tank to obtain a first measurement of optical density of said liquid;

thereafter applying an electric field between said electrodes, thereby causing the unfloculated of said colloidal particles to move from a first of said electrodes toward a second of said electrodes;

thereafter, after a predetermined period of time, again

measuring the intensity of said beam of radiation after passage thereof through said tank to obtain a second measurement of optical density of said liquid, while maintaining said beam of radiation closely adjacent said first electrode; and

comparing the first and second measurements of optical density to obtain a measurement of the change in optical density of the liquid as a function of the amount of unfloculated of said colloidal particles within said liquid;

the predetermined dosage of coagulant material added in each of said density change measuring operations being different; and

comparing the measurements of change in optical density obtained from each of said density change measuring operations to determine the particular dosage representative of the least amount of change in optical density, such particular dosage representing the optimum dosage to achieve optimum clarification of the liquid to be treated.

4,113,597

CATHODIC ELECTRODEPOSITION OF POLYAMINE RESINS USING CARBONIC ACID NEUTRALIZATION

Rafat T. Rabi, Villa Park, Ill.; Edward J. Murphy, Williamsport, Pa., and John A. Basoms, Chicago, Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Nov. 26, 1976, Ser. No. 745,240
Int. Cl.² C25D *13/06, 13/10*
U.S. Cl. 204—181 C **9 Claims**

1. A method for the cathodic electrodeposition of polyamine resin from a dispersion thereof in an aqueous electrocoating bath comprising, selecting a polyamine resin which is stably dispersible in water in the form of a salt with a solubilizing acid at a pH of from 6.0–7.5, a proportion of the amine groups in said polyamine resin within said bath being reacted with a relatively nonvolatile solubilizing acid, substantially completely neutralizing said polyamine resin with carbonic acid, dispersing said neutralized resin in water in the form of an amine carbonate or bicarbonate, and passing a unidirectional electrical current through an aqueous electrocoating bath containing said amine carbonate or bicarbonate at pH 6.0–7.5 to deposit said polyamine resin at the cathode and cause the release of carbon dioxide.

4,113,598

METHOD FOR ELECTRODEPOSITION

Edward L. Jozwiak, Jr., Gibsonia, and Suryya K. Das, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 599,746, Jul. 28, 1975. This application Jun. 7, 1977, Ser. No. 804,410
Int. Cl.² C25D *13/06*
U.S. Cl. 204—181 R **7 Claims**

1. A method of coating an electrically conductive surface which comprises passing electric current between an electrically conductive anode and an electrically conductive cathode in contact with a water-dispersed coating composition comprising a resinous vehicle which is the addition polymerization reaction product of:

(A) a material having $CH_2{=}C<$ moieties,

(B) an at least 30 percent neutralized reaction product of:

(1) an alpha, beta-ethylenically unsaturated dicarboxylic acid or its anhydride containing from 4 to 11 carbon atoms, and

(2) polybutadiene which is a liquid at room temperature and which has a molecular weight of 700–5000;

said polymeric reaction product having been produced in aqueous medium in the presence of an oil-soluble free radical polymerization catalyst and a chain transfer agent.

4,113,599

SPUTTERING TECHNIQUE FOR THE DEPOSITION OF INDIUM OXIDE

F. Howard Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 26, 1977, Ser. No. 836,269
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 P **6 Claims**

1. A method for the controlled deposition of an oxide-containing film of a metal selected from the group consisting of metals having an atomic number from 48 to 51 and mixtures thereof, comprising the steps of

a. evacuating a coating chamber to a pressure less than 10^{-1} torr;

b. flowing through said chamber a gas mixture comprising oxygen and a chemically inert gas while maintaining a total pressure of less than 10^{-1} torr;

c. heating a substrate selected from the group consisting of glass and other refractory materials to at least 200° C. in the evacuated chamber;

d. applying sufficient voltage to a cathode, spaced from and in facing relation to said substrate and faced with the selected metal, to cause sputtering of the selected metal;

e. monitoring the discharge current and gas pressure in the chamber during the course of sputtering;

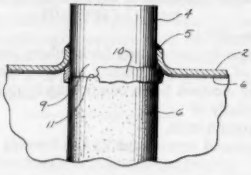
f. increasing the flow rate of oxygen and decreasing the flow rate of the chemically inert gas into the chamber as necessary in response to changes in said monitored discharge current and gas pressure to maintain a constant discharge current at a constant pressure.

4,113,600

FLUE PIPE ANODE RING FOR WATER HEATER

Robert E. Cook, Kankakee, Ill., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Apr. 21, 1977, Ser. No. 789,643
Int. Cl.² C23F *13/00*
U.S. Cl. 204—197 **1 Claim**

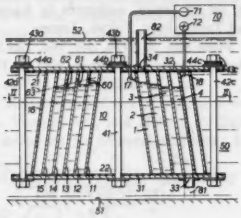


1. In a water heater having a shell and an upper head secured to the shell and a glass coating fused to the inside of the shell and head, a metal flue extending through the upper head and secured to the head to provide a tight joint therebetween to discharge products of combustion, a glass coating on the outside of the flue extending to a line slightly removed from the inside of the upper head to expose the metal of the flue below the upper head, and anodic metal selected from the group consisting of zinc, aluminum and magnesium flame sprayed in the form of a continuous strip of metal on the exposed metal of the flue in intimate mechanical bond and electrical contact therewith and over the upper terminating end portion of the glass coating on the flue and into the joint between the head and shell to provide a press fit with the head and shell and a more consistent fit between the upper head and shell and operate as a separate located anode to protect any exposed metal of the flue directly below the upper head from corrosion.

4,113,601
WATER DECOMPOSING APPARATUS

Ernst Spirig, Movenstrasse 37, CH-8640 Rapperswil, Switzerland

Filed Feb. 4, 1977, Ser. No. 765,677
Claims priority, application United Kingdom, Dec. 9, 1976, 51446/76
Int. Cl.[2] C25B *15/00*
U.S. Cl. 204—230 13 Claims



1. Water decomposition apparatus for producing detonating gas, comprising

(a) an electrode assembly including

(1) a plurality of concentrically arranged vertically oriented hollow electrodes, the innermost and outermost electrodes being imperforate throughout their lengths, each of the intermediate electrodes containing adjacent its upper end at least one aperture;

(2) upper and lower insulating and sealing members cooperating with the upper and lower ends of said electrodes to form concentrically arranged individual cells between each adjacent pair of said electrodes, respectively, said lower member containing an inlet opening in communication with one of the innermost and outermost cells, and said upper member containing an outlet opening in communication with the other one of said innermost and outermost cells;

(3) means for supplying a liquid electrolyte into said one cell via said inlet opening, thereby to effect successive filling of said cells to the levels of the apertures associated therewith; and

(b) means for applying a direct-current potential across said innermost and outermost electrodes, whereby the gas evolved in said cells by said potential flows toward said outlet opening via the apertures associated with said cells.

4,113,602
INTEGRATED PROCESS FOR THE PRODUCTION OF HYDROCARBONS FROM COAL OR THE LIKE IN WHICH FINES FROM GASIFIER ARE COKED WITH HEAVY HYDROCARBON OIL

Martin L. Gorbaty, Fanwood, N.J.; Frank F. Tao, and Peter S. Maa, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

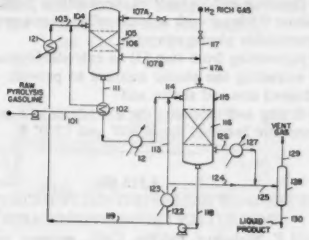
Filed Jun. 8, 1976, Ser. No. 693,830
Int. Cl.[2] C10G *1/04, 1/08, 9/32*
U.S. Cl. 208—8 12 Claims

1. In a process wherein carbonaceous solids are gasified in a fluidized bed gasifier to produce a raw product gas and solid fines are carried overhead from said fluidized bed gasifier with said gas and separated from the gas, the improvement which comprises blending the separated fines with from about 0.1 to about 5 parts by weight per part of said fines of a heavy hydrocarbon oil boiling above about 1000° F., coking the resulting blend at atmospheric pressure and recovering coke particles having an average particle size substantially greater than that of said fines.

4,113,603
TWO-STAGE HYDROTREATING OF PYROLYSIS GASOLINE TO REMOVE MERCAPTAN SULFUR AND DIENES

William V. Bauer, New York, N.Y., assignor to The Lummus Company, Bloomfield, N.J.

Filed Oct. 19, 1977, Ser. No. 843,413
Int. Cl.[2] C10G *23/04*
U.S. Cl. 208—89 14 Claims



1. A process for hydrotreating a liquid petroleum fraction, containing dienes and mercaptan sulphur, comprising:

hydrotreating said liquid fraction, containing dienes and mercaptan sulphur, in a first stage in the presence of a non-noble metal catalyst to reduce the mercaptan sulphur content thereof; and

hydrotreating hydrotreated product from the first stage in a second stage in the presence of a noble metal catalyst to reduce the diene value.

4,113,604
PROCESS FOR TREATING A SOUR PETROLEUM DISTILLATE WITH ANION EXCHANGE RESIN AND WITH METAL PHTHALOCYANINE CATALYST

David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed May 23, 1977, Ser. No. 799,825
Int. Cl.[2] C10G *27/06*
U.S. Cl. 208—206 7 Claims

1. A catalytic process for treating a mercaptan-containing sour petroleum distillate contaminated with acidic catalyst toxins or toxin precursors which comprises:

(a) contacting in a first step said distillate with an anion exchange resin comprising a porous styrene-divinylbenzene cross-linked polymer matrix having tertiary amine functional groups and recovering said distillate reduced in mercaptan content and substantially free of acidic catalyst toxins and precursors thereof;

(b) contacting in a second step said resultant distillate from step (a) with a supported metal phthalocyanine catalyst in admixture with an oxidizing agent and an alkaline solution having a pH of from about 9 to about 14; and

(c) recovering the thus treated distillate from step (b) substantially free of mercaptans.

4,113,605
CATALYTIC HYDROFINING PROCESS

Grant A. Mickelson, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 776,762, Mar. 11, 1977, Pat. No. 4,094,820. This application Oct. 28, 1977, Ser. No. 846,419
Int. Cl.[2] B01J *23/88, 23/28;* C10G *13/06*
U.S. Cl. 208—216 10 Claims

1. A process for the hydrofining of a mineral oil feedstock containing organic sulfur and/or nitrogen compounds, which comprises contacting said feedstock plus added hydrogen, and under hydrofining conditions, with a sulfided catalyst which, prior to sulfiding, contained about 2–20 weight-percent of CoO

and/or NiO and about 5–35 weight-percent MoO_3, said catalyst having been prepared by the steps of:

(1) reacting in an aqueous slurry at least one carbonate or hydroxide of cobalt or nickel with at least a stoichiometric proportion of MoO_3 and/or molybdic acid to form finely divided undissolved crystalline cobalt- and/or nickel molybdate in aqueous suspension;

(2) mixing said aqueous suspension with sufficient alumina hydrate consisting essentially of gelatinous boehmite to provide about 50–90 wt.% Al_2O_3 in the finished catalyst;

(3) digesting and/or mulling the resulting mixture for at least about 0.5 hour with at least sufficient water to provide an extrudable plastic mixture;

(4) recovering from step (3) an extrudable plastic mixture;

(5) extruding the plastic mixture to provide extrudates of desired size and shape; and

(6) drying and calcining the extrudates at a maximum temperature between about 800° and 1500° F.

4,113,606
METHOD OF REMOVING SULFUR-CONTAINING IMPURITIES FROM HYDROCARBONS

Bernard F. Mulaskey, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 28, 1976, Ser. No. 727,488
Int. Cl.² C10G *29/04*
U.S. Cl. 208—244 **7 Claims**

1. In a process for removing an impurity comprising sulfur from a refined hydrocarbon feed by contacting said feed with a metal sulfide- and mercaptide-forming agent under sulfide- and mercaptide-forming conditions, thereby forming a metal sulfide and/or mercaptide, the improvement comprising employing as said agent a rigidly interconnected pack of irregularly shaped particles, said pack having a pore volume of at least 0.15 cc per cc and having access channels among said particles throughout said pack, said channels being interconnected macropores having diameters, as determined by mercury porosimetry, in the range of from about 0.1 to about 15 microns, and said macropores contributing at least 5 percent of said pore volume; said particles of said pack being (1) of the same or different materials and (2) sized in the average diameter range below about 0.15 mm; and (3) composed of at least one material selected from the group consisting of (a) the metals copper, iron and zinc and sulfide- and mercaptide-forming compounds of said metals, (b) composites of at least one of said metals and compounds in (a) with at least one refractory oxide selected from the oxides of the metals of Groups II, III and IV of the Periodic Chart of the Elements and (c) at least one of said refractory oxides; said pack (1) having a surface area in the range of from about 2 to 700 square meters per gram, and (2) containing at least one weight percent of said at least one material listed in 3(a) above.

4,113,607
DENITRIFICATION PROCESS FOR HYDROGENATED DISTILLATE OILS

Stephen J. Miller, Emeryville, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 3, 1977, Ser. No. 773,995
Int. Cl.² C10G *21/00, 29/12*
U.S. Cl. 208—254 R **9 Claims**

1. A process for upgrading a hydrogenated distillate oil containing a residual nitrogenous component in an amount, calculated as nitrogen, in the range of from about 10 to 600 ppmw, comprising:

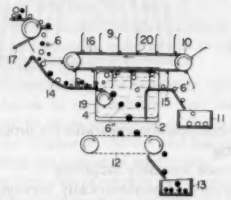
(1) extracting a major portion of said component from said oil using a solution of ferric chloride, said extracting being under conditions including (a) a temperature in the range of from about 0° to 50° C and (b) a solution-to-oil volume ratio in the range of from about 0.1 to 5, said solution containing at least a major portion of furfural as the solvent thereof and containing said ferric chloride therein in the range of from about 0.001 to 10 weight percent thereby forming a raffinate oil phase containing a minor portion of said nitrogenous component; and

(2) withdrawing said raffinate oil phase from step (1).

4,113,608
APPARATUS FOR SEPARATING NON-MAGNETIC MATERIALS OF DIFFERENT DENSITIES

Saburo Kazama, Hiratsuka; Hideo Abe, Yokosuka; Isao Satoh, Yokohama; Takashi Ikeguchi, Hitachi; Shunsuke Nogita, Hitachi; Masayoshi Kubota, Hitachi, and Kiyoshi Muramori, Yokohama, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Sep. 3, 1976, Ser. No. 720,502
Claims priority, application Japan, Sep. 3, 1975, 50-10600
Int. Cl.² B03B *5/28, 13/04*
U.S. Cl. 209—1 **3 Claims**



1. An apparatus for separating substantially non-magnetic materials of different densities, comprising:

means, including a pair of poles pieces laterally spaced from each other on opposite sides of a horizontal conveying path, for generating a magnetic field having a gradient in a vertical direction in an air gap defined between the pair of spaced magnetic pole pieces through which the conveying path extends; generally vertical side walls generally parallel to and on opposite sides of the conveying path; a quantity of magnetic fluid retained completely between both of said side walls, having opposed open entrance and exit end surfaces aligned with the conveying path and an open bottom surface;

a first horizontal guide bottom for supplying the materials to be separated to the magnetic fluid and extending from an end portion outside of one end of said magnetic fluid along said conveying path through the entrance surface of said magnetic fluid to an inside end portion within said magnetic fluid;

a second horizontal guide bottom extending from an inner end portion within said magnetic fluid that is horizontally spaced from and aligned with the first guide bottom inner end, extending along said conveying path through the exit surface of said magnetic fluid to an outside end portion outside of the opposite end of said magnetic fluid, for discharging materials separated by flotation within said magnetic fluid, and having a portion depending from the inner end to adjacent said open bottom surface;

means for supplying a mixture of substantially non-magnetic material of different densities onto the outside end portion of said first horizontal guide bottom;

an endless conveyor means located completely above said magnetic fluid having an endless array of downwardly opening comb-like flights extending into said magnetic fluid and running horizontally along the conveying path through an upper part of said magnetic fluid between said side walls, above said guide bottoms, and through said entrance and exit surfaces of said magnetic fluid;

said conveying means raking material supplied onto the outside end of said first horizontal guide bottom along said first horizontal guide bottom through said entrance surface and into said magnetic fluid to the spacing between said inner end portions of said first and second horizontal guide bottoms, conveying the ones of said materials that are floating within the spacing between said inner end

portions across the spacing between said inner end portions onto said inside end portion of said second horizontal guide bottom;

said conveyor means further raking the floating ones of said materials along said second guide bottom through said exit surface and out of said magnetic fluid to a recovery station; and

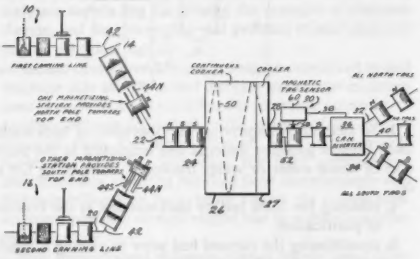
separate means for recovering the others of said materials after they have sunk downwardly in said magnetic fluid through said open bottom surface from the spacing between said inner end portions and downwardly below the endless path of said flights, said separate means being located entirely beneath said magnetic fluid.

4,113,609

MAGNETIC CAN SORTER

Charles A. King, Vienna, Va., and Robert P. Gutterman, Bethesda, Md., assignors to General Kinetics, Incorporated, Rockville, Md.

Filed Aug. 20, 1976, Ser. No. 716,285
Int. Cl.[2] B07C 5/34
U.S. Cl. 209—609 **23 Claims**



1. A magnetic can sorting method, comprising:

(a) filling and closing cans in a first line;

(b) filling and closing cans in a second line;

(c) magnetically tagging each can from the first line with a like sense of polarity, and not likewise tagging the cans from the second line thereby providing a basis for discriminating between cans originating in the first and second line; in step (c) the sidewall of each can from the first line being magnetized in a sense which provides a north pole adjacent the same one end of each can from the first line, and a south pole adjacent the same opposite end of each can from the first line;

(d) after performing step (c), merging the cans from the first and second lines into a common group;

(e) performing at least one processing or transporting step in common upon the common group of cans;

(f) examining each can for the presence of said like sense of polarity;

in step (f) a like end of each can being moved into proximity with an electrical conductor whose electrical conductivity is substantially affected by the proximity and orientation of a magnetic field but not by the velocity of each can relative to the conductor; and the examining step includes

sensing whether change in conductivity of the electrical conductor is characteristic of that produced by proximity of a can tagged with said like sense of polarity;

in moving each can into proximity with an electrical conductor, said like end of each can is brought into proximity with a ring-shaped probe element of the electrical conductor, the ring-shaped probe having substantially the same diameter as the can and each examination being made at the respective moment when each respective can is substantially in coaxial registry with the probe;

and on the basis of such exmination:

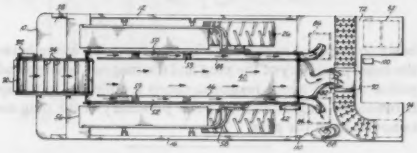
(g) sorting the common group of cans into a first sort consisting of cans having said like sense of plarity and a second sort consisting of cans not having said like sense of polarity.

4,113,610

AGRICULTURAL SORTING AND PACKING APPARATUS

Loren H. Mueller, Rte. 7, Box 62, Yakima, Wash. 98903

Filed Oct. 28, 1976, Ser. No. 736,560
Int. Cl.[2] B07C 7/00
U.S. Cl. 209—705 **6 Claims**



1. An agricultural sorting and packing apparatus comprising in combination:

(a) a base frame construction,

(b) an input conveyor assembly mounted on said frame construction carrying a slanted upward moving endless belt for receiving associated harvested produce,

(c) a sorting conveyor assembly mounted on said frame construction sequentially next to said input conveyor assembly for receiving said produce to be sorted, said sorting conveyor carrying a substantially horizontally positioned moving endless belt,

(d) a control station assembly mounted on said frame construction, sequentially next to said sorting conveyor, comprising guideways and a platform, for guiding said sorted produce from said sorting conveyor belt via said guideways to containers positioned on said platform for packing and shipping,

(e) said input conveyor assembly, said sorting conveyor assembly and said control station assembly mounted in compact, successive arrangement whereby said sorting conveyor assembly is located at an elevated position so that an associated tractor or the like is positioned and fastened by connecting means for fastening said tractor underneath said sorting conveyor assembly to said base frame construction, and wherein said input conveyor assembly can be manually removed from said frame construction whereby an entry opening is formed in said agricultural sorting and packing apparatus front portion for receiving said tractor so that part of said frame construction remains underneath said tractor between said tractor's wheels for mounting of said tractor at rear and front to said frame construction, and

(f) said connection means for said tractor to said frame construction comprises (1) back-in-rear tractor connector means mounted to said frame construction, and (2) front fastening means provided between said tractor front portion and said base frame construction for mounting said tractor to said frame construction so that said tractor, when mounted to said frame construction, forms a one mobile unit.

4,113,611

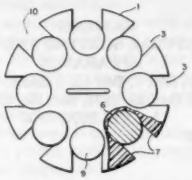
MAGNETIC PIPE CLEANER

William G. Gohm, Springfield, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 16, 1976, Ser. No. 742,474
Int. Cl.[2] B03C 1/28
U.S. Cl. 209—215 **6 Claims**

1. A magnetic pipe cleaner comprising a cylindrical non-

magnetic plug slightly smaller in diameter than the pipe to be cleaned, means for attaching a cable to said plug, said plug having a plurality of radially disposed kerfs extending inwardly from the outer periphery thereof, a plurality of magnets disposed in the bottom portions of said kerfs, said magnets



being so disposed in said kerfs so that there is a space between the outer periphery of the plug and the magnet, whereby when pulled through a pipe magnetic debris is collected in the space between the magnet and the outer periphery of the plug and is removed from the pipe.

4,113,612

METHOD OF IMPROVING THE BACKWASHING OF FIXED BEDS FORMED OF GRANULAR MATERIALS

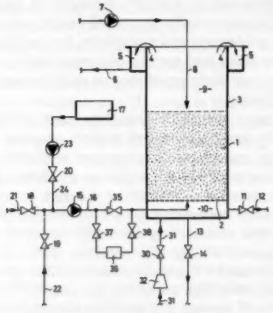
Ivan Sekoulov, and Wolf-Rüdiger Müller, both of Stuttgart, Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 25, 1977, Ser. No. 771,959

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1976, 2608899

Int. Cl.[2] C02C *1/04*; B01D *37/00*

U.S. Cl. 210—17 **23 Claims**



1. A method of improving the backwashing of fixed beds composed of granular material and employed in the purification of waste water of sewage or in the preparation of water, comprising the steps of:

filling the fixed bed during the course of a backwashing operation with a liquid containing hydrogen peroxide;

maintaining the fixed bed filled with said liquid during a predetermined period of time while the liquid is in a substantially quiescent state;

contacting said liquid containing hydrogen peroxide with at least one catalyst taken from the group consisting essentially of granular iron, manganese dioxide, potassium permanganate, or an enzyme or enzyme product of a microorganism which yields oxygen as a gaseous component as a result of a spontaneous, catalytically triggered decomposition reaction;

allowing such decomposition reaction to occur in the fixed bed and rapidly releasing gaseous oxygen in a short time to intensely agitate the filter bed; and

then backwashing the fixed bed of water.

4,113,613

METHOD OF IMPROVING THE OPERATION OF BACKWASHABLE FIXED BEDS FORMED OF GRANULAR MATERIALS

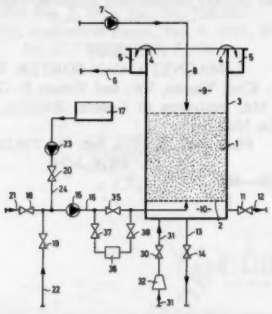
Ivan Sekoulov, and Wolf-Rüdiger Müller, both of Stuttgart, Fed. Rep. of Germany, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 25, 1977, Ser. No. 771,958

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1976, 2608899

Int. Cl.[2] C02C *1/04*; B01D *37/00*

U.S. Cl. 210—17 **14 Claims**



1. A method of improving the operation of backwashable fixed beds of granular material and employed in the purification of waste water or water treatment, comprising the steps of:

a. cleaning the fixed bed by backwashing at the conclusion of purification;

b. conditioning the cleaned bed prior to placing it onstream for filtration, and conditioning step being carried out by filling the fixed filter bed with a liquid containing hydrogen peroxide in an amount effective to release gaseous oxgyen;

c. contacting said hydrogen peroxide containing liquid with a catalyst capable of spontaneously reacting with said hydrogen peroxide to release gaseous oxygen as a decomposition product; and

d. placing the conditioned filter bed onstream for filtering waste water to be purified.

4,113,614

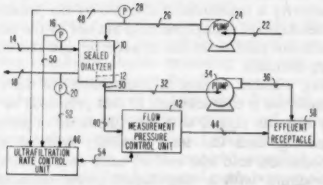
AUTOMATED HEMODIALYSIS TREATMENT SYSTEMS

Anita Hand Rollo, Hollywood, and David Burrell Stearns, Lighthouse Point, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,585

Int. Cl.[2] B01D *13/00, 31/00*

U.S. Cl. 210—22 A **19 Claims**



1. An automated hemodialysis treatment system for controlling ultrafiltration rate to a preset value, measuring said ultrafiltration rate, and measuring the total quantity of ultrafiltrate removed from a patient under treatment comprising:

a sealed dialyzer separated into a blood side and a dialysate side by a semipermeable membrane having constant and known filtration characteristics for removing water and impurities from the blood;

a blood supply line connected to said blood side of said dialyzer for supplying blood to be treated from said patient under treatment;

blood supply pressure sensing means connected to said blood supply line for sensing the pressure of said blood to be treated and for converting said pressure of said blood to be treated into an electrical signal;

a blood return line connected to said blood side of said dialyzer for returning treated blood to said patient under treatment;

blood return pressure sensing means connected to said blood return line for sensing the pressure of said treated blood therein; and for converting said pressure of said treated blood into an electrical signal;

a dialysate supply means connected to said dialysate side of said sealed dialyzer via a dialysate supply line for pumping dialysate into said sealed dialyzer; the pumping rate of dialysate entering said dialyzer being the same as the pumping rate of dialysate effluent leaving said dialzyer;

dialysate supply pressure sensing means connected to said dialysate supply line for sensing the pressure of dialysate therein, and for converting said pressure of said dialysate into an electrical signal;

flow measurement pressure control means connected to said dialysate side of said sealed dialyzer via a flow measurement pressure control input line for receiving a quantity of dialysate effluent equivalent to the amount of ultrafiltrate removed from the blood through said semipermeable membrane, and for controlling the fluid pressure and simultaneously metering the fluid flow therethrough; said dialysate effluent, in turn, being routed via a flow measurement pressure control output line to a dialysate effluent receptacle;

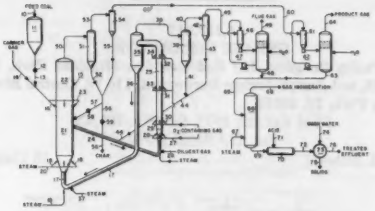
said flow measurement pressure control means being comprised of valve means for controlling the flow of said dialysate effluent through said flow measurement pressure control input line into said flow measurement pressure control means, and for controlling the flow of said dialysate effluent out of said flow measurement pressure control means and into said flow measurement pressure control output line; at least two fluid chambers with pistons therein connected to said valve means with each of the two fluid chambers receiving and transmitting a known volume of dialysate effluent at alternate times; the pistons in each of said at least two fluid chambers providing a bias force against the filling of the two fluid chambers; a reciprocating motor for supporting an arm that is operably connected to the pistons at ends that are opposite the ends of the pistons that provide a bias force against the filling of the fluid chambers; said reciprocating motor providing reciprocating motion to the arm to control the amount of bias force that is imparted to the pistons via the arm to thereby control the pressure in the dialysate system; and switching means comprised of at least two switches that are positioned so as to be activated by the ends of the arm as it is being reciprocated, and with each activation of the switches corresponding to the known volume of dialysate effluent that is received by each of the fluid chambers; and

ultrafiltration rate control means operatively connected to said flow measurement pressure control means via a sensor-control instrumentation conductor and said ultrafiltration rate control means also being operatively connected to said electrical signal of said blood supply pressure sensing means, said electrical signal of said blood return pressure sensing means and said electrical signal of said dialysate supply pressure sensing means for controlling said ultrafiltration rate to a preset value, measuring said ultrafiltration rate and said total quantity of ultrafiltrate removed from said patient under treatment.

4,113,615
METHOD FOR OBTAINING SUBSTANTIALLY COMPLETE REMOVAL OF PHENOLS FROM WASTE WATER

Martin L. Gorbaty, Fanwood, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 3, 1975, Ser. No. 637,443
Int. Cl.[2] C02B *1/14*; C02C *5/02*
U.S. Cl. 210—40 **15 Claims**



9. A process for the substantially complete removal from waste of organic compounds whose molecules dissociate in solution to produce organic aniors and hydrogen ions comprising:

(a) contacting said waste water in a contacting zone with char derived from the thermal processing of a coal that yields an ash containing a total of at least 15 weight percent calcium, magnesium, potassium and sodium expressed as oxides on a moisture-free basis when completely burned;

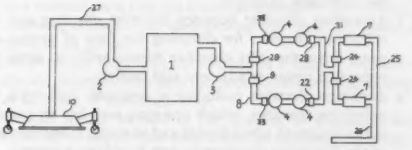
(b) maintaining the pH of the resultant slurry in said contacting zone at a value such that the ratio of the highest dissociation constant of said organic compounds to the hydrogen ion concentration of said slurry is less than about 0.01; and

(c) recovering said waste water depleted in said organic compounds from said contacting zone.

4,113,616
FISH MANURE REMOVAL METHOD

Richard W. Kaes, 910 Robertson St., Buhl, Id. 83316

Filed Jul. 25, 1977, Ser. No. 818,946
Int. Cl.[2] B01D *21/00, 29/10*
U.S. Cl. 210—67 **1 Claim**



1. A method for recovering fish manure in amounts sufficient for commercial use, from a fish pond, by means of a portable, self-contained apparatus, said method comprising:

(a) sucking a quantity of a suspension of fish manure and other solids through a movable vacuum chamber which comprises a plate having a plurality of holes suitably sized to prohibit the passage of fish therethrough, said vacuum chamber being attached to the remaining elements of said apparatus by a long flexible conduit means;

(b) passing said quantity through said conduit means by vacuum, to a settling tank; said settling tank being suitably sized to provide a period of time sufficient to allow pebbles, sand and other heavy debris to come out of suspension from said quantity and fall to the bottom of the settling tank;

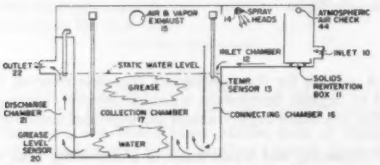
(c) pumping the remainder of said quantity from said settling tank through hydrocyclone means, to provide a dewatered fish manure underflow stream and an effluent water overflow stream;
(d) passing said effluent water overflow stream through basket filter means, so as to remove residual fish manure therefrom;
(e) combining said residual fish manure and said dewatered fish manure underflow stream to provide said amount suitable for commercial use.

4,113,617

GREASE SEPARATOR

Fred Phillip Bereskin, 117 Red Oak La., Highland Park, Ill. 60035, and Joseph Jerome Borowczyk, 116 W. Central Blvd., Villa Park, Ill. 60181

Filed Apr. 21, 1977, Ser. No. 789,426
Int. Cl.[2] B01D *17/04*
U.S. Cl. 210—72 16 Claims



1. A system for separating hot, emulsified grease and oil from water to prevent contamination of a sewage system comprising:
an inlet chamber, including a plurality of steel plates forming the chamber walls and floor, a solids retention bed adjacent one wall of the chamber, an inlet channel extending through said one wall and into said box, a temperature sensor positioned below the chamber floor for providing a control signal dependent on temperature and, at least one water spray head positioned in the chamber walls, and means to provide said hot, emulsified grease and oil as a free flowing film on said chamber floor; said at least one spray head being sized to spray cool, ambient temperature water over substantially the entire of said free flowing film;
a collection chamber also having a plurality of steel plates forming the chamber walls and floor, a plurality of baffles positioned to deflect incoming liquids upwardly, and a grease level sensor at a desired height above the floor of the collection chamber;
a connecting chamber between the inlet chamber and the collection chamber for directing the flow of grease and water from the inlet chamber downwardly to enter the collection chamber adjacent said baffles;
a discharge chamber including a common wall with the collection chamber, which common wall has an opening at the bottom to admit liquids and an outlet in another wall of the discharge chamber to pass liquids to a sewer;
a valve coupled to a source of water supply and responsive to the control signal; and,
a means between the solenoid valve and spray heads for preventing back-up of liquids through the valve to the water supply.

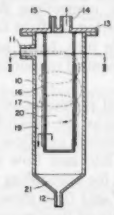
7. The method of separating heated emulsified grease from water to prevent the contamination of a sewer system by cooling and sequentially regulating passage of the grease and water mixture through a grease-separator system having an inlet chamber, a collection chamber and a discharge chamber, said inlet chamber having a sensing means for sensing temperature, a spray means for spraying cool, ambient temperature water into the inlet chamber and an actuating means for actuating said spray means, comprising the steps of:
admitting the heated emulsified grease and water mixture into said inlet as a free flowing film on the horizontal planar floor of said inlet chamber;
sensing the temperature of the heated mixture in the inlet chamber by said sensing means;
signaling said actuating means with said sensing means;
actuating said spray means with said actuating means so as to spray substantially the entire of said free flowing film with said water;
allowing said cooled mixture to pass from the inlet chamber into the bottom of said collection chamber;
said grease separating from the cooled mixture and rising to the top of the mixture;
the water separating from the cooled mixture and sinking to the bottom of the collection chamber; allowing the separated water to pass from the bottom of the collection chamber to the bottom of said discharge chamber and to be removed from said system, and,
removing the cooled and separated grease from the collection chamber.

4,113,618

METHOD OF AND APPARATUS FOR SOLID-LIQUID SEPARATION

Yasuo Koseki; Sankichi Takahashi, both of Ibaraki, and Azuma Nakaoka, Chiba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 8, 1976, Ser. No. 748,762
Claims priority, application Japan, Dec. 8, 1975, 50-145085; Jan. 7, 1976, 51-885
Int. Cl.[2] B01D *29/38*
U.S. Cl. 210—82 16 Claims



1. Method of treating a process fluid consisting of liquid and suspended solid particles for separation of the solid particles from the liquid with elastic sheet filter comprising steps of:
providing the elastic sheet filter with a plurality of pores for filtration formed such that the pore diameter is larger than an average diameter of the solid particles and smaller than the maximum diameter of the solid particles and an original shape prior to filtration;
passing the process fluid to the sheet filter so that the liquid and particles smaller than the average pass through the sheet filter to develope a pressurized filter residue layer of the solid particles that are larger than average to be held on the sheet filter, thereby increasing filtration with the filtered residue layer of the solid particles that are larger than average so as to thereafter filter out both the solid particles that are smaller and larger than average as the liquid continues to pass through the sheet filter;
thereafter continuing the passing of the process fluid to the sheet filter and the filtering out of substantially all of both the larger and smaller than average particles with the filtered residue layer to increase the filter pressure and correspondingly elastically deform the elastic sheet filter from its original shape until the fluid flow resistance reaches an undesirable level; and
thereafter, before any further filtering, stopping said passing of the process fluid to and the liquid through the sheet filter when the fluid flow resistance reaches the undesirable level so that the elastic sheet filter will return to its

original shape and causing the liquid surrounding the filtered residue to flow in the counter direction to liquid flow occurred during filtration of the liquid to separate the filtered residue from the elastic sheet filter in large flakes.

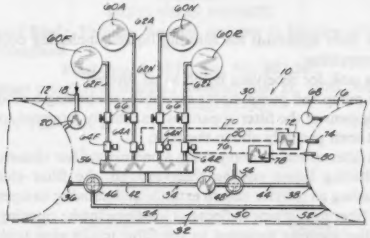
6. Apparatus as defined in claim 5, wherein the elastic sheet filter means comprises an elastic filter net and means for supporting the filter net.

4,113,619

WASTE FLUID TREATMENT SYSTEM

James R. Arrington, Muskego, Wis., assignor to Arrington Co., Inc., Muskego, Wis.

Filed Mar. 22, 1973, Ser. No. 343,733
Int. Cl.² C02B 3/06, 1/20
U.S. Cl. 210—96 R **3 Claims**



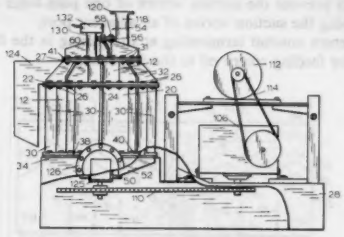
1. A system for treating a waste fluid containing a chemically reactive substance comprising a storage tank including a fluid outlet, a reaction tank including a fluid inlet and a fluid outlet, first conduit means connecting said storage tank outlet and said reaction tank inlet in fluid communication, a pump located in said first conduit means and dividing said first conduit means into an upstream portion and a downstream portion, second conduit means connecting said reaction tank outlet and said first conduit means upstream portion in fluid communication, third conduit means communicating with said first conduit means downstream portion for discharging fluid from the system, first valve means connected between said first conduit means downstream portion and said third conduit means for selectively controlling fluid flow from said first conduit means downstream portion into said reaction tank and from said first conduit means downstream portion into said third conduit means, second valve means connected between said first conduit means upstream portion and said second conduit means for selectively controlling fluid flow from said storage tank to the upstream side of said pump and from said second conduit means to the upstream side of said pump, means for selective, coordinated actuation of said first and second valve means so that said pump selectively transfers the fluid from said storage tank through said first conduit means including said pump and into said reaction tank, recirculates the fluid from said reaction tank, through said second conduit means, and through first conduit means including said pump and into said reaction tank, and discharges the fluid from said reaction tank through said second conduit means, through said first conduit means including said pump, and through said third conduit, means for containing a treatment reagent for the waste fluid, and means for selectively connecting said reagent container means in communication with said first conduit means upstream portion between said second valve means and said pump whereby pumping action of said pump draws the treatment reagent into the system.

4,113,620

PULP PRESS HAVING A PLANAR DEWATERING DISC BELOW AN ANNULAR PRESS CHAMBER

Eigild S. Thomsen, 1110 SW. Hallinan Cir., Portland, Oreg. 97034

Filed Oct. 26, 1976, Ser. No. 735,906
Int. Cl.² B30B 9/20
U.S. Cl. 210—152 **16 Claims**



1. A press for removing liquid continuously from aqueous pulp comprising:

(a) a cylindrical housing;

(b) a planer de-watering disk located intermediate the ends of the housing dividing the housing into a press chamber and a working chamber, said de-watering disk defining a plurality of openings therethrough arranged for preventing passage of the pulp while permitting passage of the liquid;

(c) a cylindrical sleeve located centrally in the press chamber so as to form an annular chamber therefrom;

(d) an annular squeeze plate located in the press chamber forming the end thereof opposite the de-watering disk, said squeeze plate being arranged in a manner for causing the cross-sectional area of the press chamber to range from a maximum area to a minimum area progressing angularly around the press chamber;

(e) at least two blades located at spaced angular positions in the working chamber and arranged for being extensible into the press chamber, each blade having a width substantially equal to the width of the press chamber, and actuation means operably engaging the blades in a manner for movement of the blades around the press chamber;

(f) means located exteriorily of the press chamber for continuously varying the extension of said blades into the press chamber, said means configured for positioning the blades in a manner such that the blades substantially fill the press chamber between the de-watering disk and the squeeze plate at all times;

(g) inlet means located in the housing in a manner for introducing aqueous pulp into the press chamber substantially at its point of maximum area;

(h) outlet means located in the housing in a manner for removal of dehydrated pulp from the press chamber substantially at its point of minimum area; and

(i) drain means located in the housing in a manner for removal of liquid from the working chamber.

4,113,621

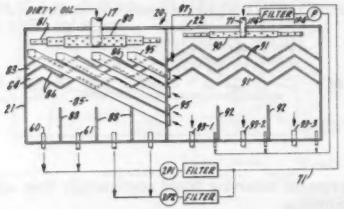
HYDRAULIC APPARATUS

Earl E. Frank, Tallman, N.Y., and Bing S. Yee, Paramus, N.J., assignors to Abex Corporation, New York, N.Y.

Division of Ser. No. 630,155, Nov. 10, 1975, Pat. No. 4,027,595.
This application Sep. 20, 1976, Ser. No. 724,720
Int. Cl.² B01D 33/40
U.S. Cl. 210—167 **17 Claims**

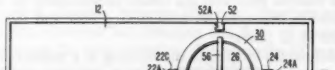
1. In a hydraulic system where filtered oil in a reservoir is to be delivered under pressure by a plurality of pressure pumps to a remote location and returned to the reservoir, reservoir apparatus comprising:

a first tank for receiving the return oil;
a second tank for containing filtered oil to be delivered;
at least three pressure pumps communicating with respective pump inlet ports in the second tank for delivering oil in the second tank to the remote location;
two of the pressure pumps being normally active and one being a normally inactive reserve pump;
said inlet ports being separated from one another by dividers to prevent the suction vortex of one port from overlapping the suction vortex of an adjacent port;
a return conduit terminating at an opening in the first tank for feeding return oil to the first tank;



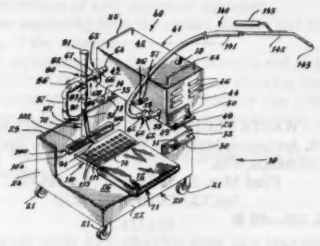
an exchange pump connected with an exchange pump inlet in the first tank for transferring oil from the first tank to the second tank through a transfer conduit having an outlet in the second tank, said transfer conduit having a filter between the exchange pump and second tank to filter oil delivered by the exchange pump to the second tank;
and a plurality of baffles interposed between the inlet ports in the second tank and said outlet in the second tank to remove turbulence from the transfer oil entering the second tank.

4,113,622
DUAL STRAINER GATE ARRANGEMENT FOR TURBINE OIL SYSTEMS
Michael Csanady, Jr., Ridley Park, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Dec. 10, 1976, Ser. No. 749,555
Int. Cl.² B01D 35/12
U.S. Cl. 210—167 **4 Claims**



1. A fluid cleansing system comprising: a plurality of strainers of predetermined mesh size with each of said strainers being fluidly sealed and independently operable from all other strainers, wherein said strainers, when assembled together in operating position, form a generally cylindrical body with fluid sealing means being disposed between the arc length extremes of each strainer in a chordwise manner along the length of said cylindrical body; and a fluid-tight, nonporous member disposable radially beyond said cylindrical body for obstructing said fluid's access to selected strainers whereby said selected strainers, during said fluid's obstruction thereto, can be purged of impurities previously removed from said fluid and inspected while unobstructed strainers continue to filter the fluid.

4,113,623
FILTER APPARATUS
Bernard G. Koether, Westport, and William J. Shaughnessy, Brookfield, both of Conn., assignors to Food Automation-Service Techniques, Inc., Stratford, Conn.
Filed Apr. 25, 1977, Ser. No. 790,429
Int. Cl.² G01D 21/16
U.S. Cl. 210—167 **16 Claims**

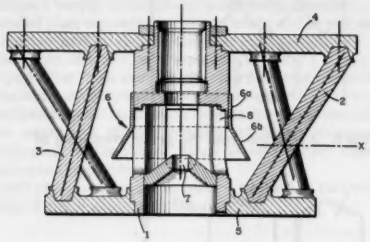


1. A filter apparatus for filtering liquids, including cooking oil, comprising:
A. a tank for receiving liquid to be filtered;
B. a pump and pump motor assembly comprising a modular element of the filter apparatus detachably mounted to and at least partially above the tank;
C. a filter assembly comprising a one-piece filter element for filtering liquid passing therethrough, the filter element having an interior and an exterior and defining an opening, a filter intake pipe defining at least one intake opening, the filter element mounted to the filter intake pipe with the filter element opening sealed to the intake pipe and the intake opening in communication with the interior of the filter element whereby liquid entering the intake opening must pass through the filter element, the intake pipe detachably mounted to the pump of the pump and pump motor assembly by means of a first quick disconnect fitting, the filter assembly being supported in the tank when so mounted and removable from the tank and pump and pump motor assembly as modular element,
whereby the filter apparatus is comprised of modular elements easily separable for cleaning, and with respect to the filter assembly, for installation or replacement of the filter element.

4,113,624
FLOTATION APPARATUS WITH MECHANICAL AGITATION
Jean-Arnaud Casalis, Mareil-Marly; Yves Teil, Sevres, and Raymond Motte, Houilles, all of France, assignors to Societe Miniere et Metallurgique de Penarroya, Paris, France
Filed Aug. 11, 1976, Ser. No. 713,371
Claims priority, application France, Aug. 14, 1975, 75 25429
Int. Cl.² B01F 3/04
U.S. Cl. 210—219 **9 Claims**

1. A flotation apparatus comprising a tank for holding a body of pulp, an agitator rotatable in said tank, means for rotating said agitator, and means for flowing pressurized gas into the pulp along an axis of said agitator, said agitator comprising two layers of bars which are disposed symmetrically on the generatrices of two opposite, coaxial truncated cones and which are mounted at their ends on circular bases, at least one base being perforated to allow passage of flotation medium and the bases being connected by a hollow central hub of which the upper portion is adapted to receive pressurized gas and the lower portion is provided with at least one orifice for discharg-

ing the gas, which agitator also includes a solid, downwardly open, frustoconical skirt which is situated between the bars and



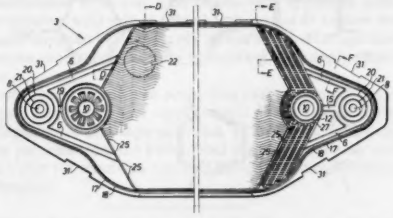
the central hub, is coaxial with the hub and is attached at its upper end to the hub.

4,113,625

DIFFUSION DEVICE

Gerhard Riede, Vellinge, Sweden, assignor to Gambro AG, Zug, Switzerland

Filed Jun. 2, 1977, Ser. No. 802,363
Claims priority, application Sweden, Jun. 11, 1976, 7606623
Int. Cl.² B01D *31/00*
U.S. Cl. 210—321 B **9 Claims**



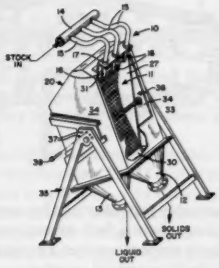
1. An apparatus for diffusing matter between a first and second fluid comprising a plurality of spacer plates, a plurality of semipermeable membranes, said spacer plates and said semipermeable membranes each including first and second openings for said first and second fluids, respectively, said spacer plates and said semipermeable membranes being arranged in a stacked configuration so that said first and second openings form first and second vertical flow passages disposed perpendicular to said spacer plates, said first fluid adapted to flow through said first vertical flow passage and said second fluid adapted to flow through said second vertical flow passage, said spacer plates including grooves formed in the upper and lower surfaces thereof which in their stacked configuration cooperate to form horizontal flow passages being disposed parallel to said spacer plates and being connected to said first and second vertical flow passages, said grooves adjacent at least one end of said spacer plates being laid out in the upper and lower surfaces of said spacer plates substantially in the shape of a first V to form a first V-shaped flow path, said first V-shaped flow path enclosing said first and second vertical flow passages and being disposed along the bisectrix of said first V-shaped flow path, said second vertical flow passage being disposed at the point of said first V-shaped flow path, at least one semipermeable membrane being disposed within each of said horizontal flow passages so that said first fluid is adapted to flow on one side of said membrane and said second fluid is adapted to flow on the other side of said membrane, said arrangement providing for the improved flow of said first and second fluids within said apparatus.

4,113,626

DEWATERING SCREEN

Theodore E. Detcher, Monroe, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Continuation of Ser. No. 614,885, Sep. 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 451,876, Mar. 18, 1974, abandoned. This application May 23, 1977, Ser. No. 799,555
Int. Cl.² B01D *21/02, 25/04*
U.S. Cl. 210—409 **4 Claims**



1. Screening apparatus of the type described for separating a flowing liquid slurry into fractions by substantially unidirectional flow along a perforate screening surface, comprising

(a) means defining a perforate screening surface having opposed sides and ends,

(b) said screening surface means being of rigid structure and concave semi-parabolic shape from end to end thereof such that the curvature thereof varies from a zero point at one end thereof through a series of short radius adjacent said one end to a maximum radii adjacent the other end thereof in accordance with the formula $Y=nX^2$ where the zero point of said curvature is at the intersection of the X and Y axes, and n varies between 1.5 and 1/12,

(c) said screening surface means including an assembly of multiple parallel bars extending in closely spaced relation substantially parallel with said ends of said surface and having exposed flat surface areas which define said semi-parabolic screening surface,

(d) the spaces between adjacent said bars constituting slots defining the perforations in said screening surface,

(e) means supporting said screening surface means with said zero point end uppermost,

(f) inlet means for supplying the slurry to said higher end of said screening surface whereby the angular velocity of the slurry is adjacent the maximum end of its range while the liquid content of the slurry is adjacent the maximum end of its range,

(g) means for collecting the fraction of the slurry which is retained on said screening surface from the lower end thereof, and

(h) means for separately collecting the fraction of said slurry which passes through said screening surface.

4,113,627

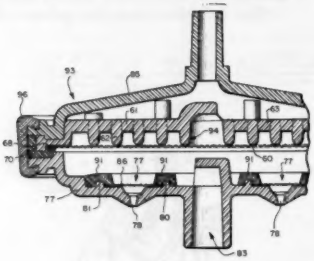
PROCESS FOR MAKING HERMETICALLY SEALED FILTER UNITS AND FILTERS MADE THEREBY

Hayden L. Leason, Humacao, P.R., assignor to Filtertek, Inc., Hebron, Ill.

Continuation-in-part of Ser. No. 653,012, Jan. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 548,544, Feb. 10, 1975, abandoned. This application May 19, 1977, Ser. No. 798,644

Int. Cl.[2] B01D *25/00*

U.S. Cl. 210—446 **13 Claims**



7. A filter assembly for a filter unit for removing bacteria and other contaminants from a fluid stream, comprising:

a thermoplastic support member, a porous filter element and a thermoplastic overmold member;

said thermoplastic support member having at least one fluid flow passageway, at least one filter aligning tab, and a flat shelf between the passageway and the aligning tab, said shelf surrounding the passageway;

said filter element extending over the passageway, its outer portion resting on the shelf with the periphery of said filter element disposed adjacent to the aligning tab; and

said thermoplastic overmold member disposed over the periphery of said filter element and over the aligning tab to seal the periphery of the filter element to the support.

4,113,628

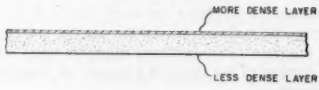
ASYMMETRIC POLYIMIDE MEMBRANES

Constance Wright Alegranti, Sao Paulo, Brazil, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

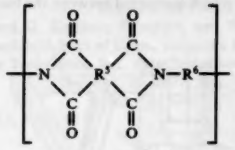
Continuation of Ser. No. 476,536, Jun. 5, 1974, abandoned, which is a continuation of Ser. No. 273,805, Jul. 20, 1972, abandoned. This application Apr. 15, 1976, Ser. No. 677,443

Int. Cl.[2] B01D *31/00*

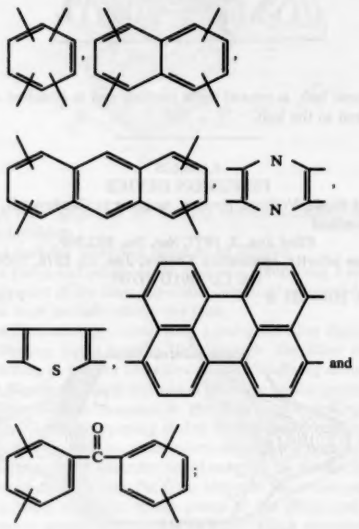
U.S. Cl. 210—500 M **6 Claims**



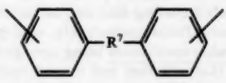
1. A microporous, opaque, asymmetric polyimide membrane not dissolving more than 10% by weight at 25° C in N,N-dimethylacetamide and consisting essentially of a polyimide having the repeating formula



wherein R^5 is selected from the group consisting of



and R^6 is selected from the group consisting of phenylene, tolylene, naphthylene, biphenylene, anthrylene, pyridinediyl and



in which R^7 is selected from the group consisting of oxygen, sulfur and methylene, said membrane being shiny on one surface and dull on the other surface, and having a corrected small angle X-ray scattering pattern such that the intensity of the scattering radiation from nickel filtered CuKα radiation multiplied by the fourth power of the scattering angle ($2\frac{1}{2}$) does not vary more than $\pm$ 10% for at least 0.2° within the angle range (2θ) from 0.2–0.8°.

4,113,629

SEPARATION DEVICE PROVIDED WITH A COALESCENCE APPARATUS

Jacob Pielkenrood, Krommenie, Netherlands, assignor to Pielkenrood-Vinitex B.V., Assendelft, Netherlands

Continuation of Ser. No. 527,583, Nov. 27, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,838

Int. Cl.[2] B01D *21/00*

U.S. Cl. 210—522 **6 Claims**

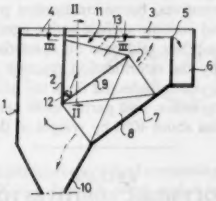
1. A separation device incorporating a coalescence apparatus to enhance the efficiency of separation without substan-

tially increasing the space occupied by the separation device, comprising:

a basin having a partition extending transversely across it to define a supply chamber and a discharge chamber;

a parallel plate separator having an intake end in said supply chamber and having an outflow end opening into said discharge chamber, said separator defining a passage for liquid flow from said supply chamber to said discharge chamber, said separator having an upper wall extending with an upward inclination from said vertical partition to the intake end of said separator to define an upwardly diverging wedge-shaped space in said supply chamber above said separator;

parallel plate coalescence apparatus situated in said wedge-shaped space above said separator;



supply means opening into a lower portion of said wedge-shaped space near its vertex, and supplying liquid to said coalescence apparatus, said coalescence apparatus communicating with said supply chamber so as to require the liquid supplied by said supply means to pass through said coalescence apparatus prior to entering said supply chamber;

said coalescence apparatus promoting particle growth in the liquid supplied by said supply means so as to enhance the effeciency of said separator; and, an outlet for removing the particles from the base of said discharge chamber and an outlet for removing clarified liquid from said discharge chamber.

4,113,630

ARTICLE FOR CONDITIONING FABRICS

Clifford K. Hagner, and Richard B. Wissel, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 25, 1977, Ser. No. 781,385
Int. Cl.[2] D06M *13/46*
U.S. Cl. 252—8.6 **23 Claims**

1. A laundry article, providing fabric softening and static-control benefits, for use in both the washer and the dryer, consisting essentially of a water-insoluble substrate, carrying an effective amount of an intimate mixture, having a maximum solublity in water of 50 ppm at 25° C and a softening point of from 100° to 200° F, consisting essentially of:

(a) from about 10 to 90% by weight of quaternary ammonium fabric conditioning compounds having the formula $[R_1R_2R_3R_4N]^+Y^-$, wherein at least one, and not more than two, of the R_1, R_2, R_3, or R_4 groups is an organic radical containing a group selected from a C_{12} to C_{22} aliphatic radical, or an alkyl phenyl or alkyl benzyl radical having 10 to 16 carbon atoms in the alkyl chain, the remaining group or groups being selected from C_1 to C_4 alkyl, C_2 to C_4 hydroxy alkyl, and cyclic structures in which the nitrogen atom forms part of the ring, Y constitutes an anionic radical selected from the group consisting of hydroxide, halide, sulfate, methyl sulfate, and phosphate ions; and

(b) from about 10 to 90% by weight of a dispersion inhibitor, being a solid organic material having a maximum solubility in water of 50 ppm at 25° C and a softening point in the range of 100° F to 200° F, said material being selected from the group consisting of paraffinic waxes, cyclic and acyclic mono- and polyhydric alcohols, substituted and unsubstituted aliphatic carboxylic acids, esters of cyclic and acyclic mono- and polyhydric alcohols and acids, condensates of C_2 to C_4 alkylene oxide with any of the foregoing types of materials, whether or not said materials themselves meet the above solubility and softening point limits, and mixtures thereof;

said intimate mixture penetrating into the substrate and extending above the substrate to a height of from about 1/32 inch to about ¼ inch.

4,113,631

FOAMING AND SILT SUSPENDING AGENT

James L. Thompson, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 10, 1976, Ser. No. 713,168
Int. Cl.[2] E21B *43/27, 43/26*
U.S. Cl. 252—8.55 C **45 Claims**

1. A composition suitable for imparting foaming and silt suspending properties to aqueous based fluids of the type suitable for use in treating subterranean formations, comprising a blend of:

(a) at least one alkyltrimmethylammonium chloride, wherein the alkyl chain length is from 8 to 18 carbon atoms and the mode alkyl chain length is 12 or 14 carbon atoms, and

(b) an amine oxide selected from the group consisting of bis(2-hydroxyethyl) cocoamine oxide, dimethylhexadecylamine oxide, and dimethyl-hydrogenated tallowamine oxide, wherein

Component (a) and Component (b) are in a weight ratio to one another of

(i) from about 45:55 to about 85:15 when Component (a) is cocotrimethyl ammonium chloride and Component (b) is bis(2-hydroxyethyl) cocoammine oxide, and

(ii) from about 40:60 to about 95:5 when said Components (a) and (b) are selected so as to provide a combination other than cocotrimethyl ammonium chloride and bis(2-hydroxyethyl) cocoamine oxide.

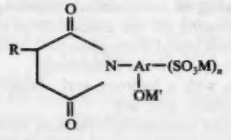
4,113,632

OIL RECOVERY BY SURFACTANT WATERFLOODING

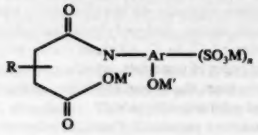
Stamoulis Stournas, Flemington, and El Ahmadi I. Heiba, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 719,135, Aug. 31, 1976, which is a continuation-in-part of Ser. No. 488,885, Sep. 15, 1974, abandoned. This application Feb. 18, 1977, Ser. No. 770,164
Int. Cl.[2] E21B *43/22*
U.S. Cl. 252—8.55 D **27 Claims**

1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems in which an aqueous fluid is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising employing as at least a portion of the fluid introduced into said injection system an aqueous solution of a surfactant selected from the group consisting of an aliphatic substituted succinimido aryl hydroxy sulfonate characterized by the formula



and its corresponding succinamic acid amide derivative characterized by the formula



wherein R is a lipophilic aliphatic group containing from 8 to 25 carbon atoms,

Ar is a mononuclear or condensed ring dinuclear aryl group,

M is an alkali metal ammonium or substituted ammonium ion, *n* is 1 or 2, and

M' is the same as M or hydrogen.

4,113,633

PENETRATING OIL COMPOSITION

Paul J. Gibbons, 831 Logan Ave., New York, N.Y. 10465

Filed Dec. 15, 1976, Ser. No. 750,735

Int. Cl.² C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—11 **2 Claims**

1. A penetrating oil composition essentially consisting of:

Mono- and di-methylbenzenes	12 – 35%
Lower alkanols (C_1 – C_4)	12 – 30%
Polymethacrylate or methyl antioxidant selected from tert-dibutyl-p-oresol, alkyl succinic acid, and zinc dialkyl thiophosphate	0.2 – 4%
Polymethacrylate or methyl silicone viscosity improving agents	0 – 5%
paraffin bright stock lube oil to	100%

4,113,634

METAL ARYL DITHIOPHOSPHATES AND THEIR MANUFACTURE

Albert R. Sabol, Munster, Ind., and Nicolas C. Petrellis, Lisle, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 1, 1977, Ser. No. 773,346

Int. Cl.² C10M *1/48, 3/42, 5/24, 7/46*

U.S. Cl. 252—32.7 E **31 Claims**

1. A process for the manufacture of metal diaryl dithiophosphate which comprises:

reacting P_2S_5 with a hydroxyl aryl compound to form a dithiophosphoric acid; and

neutralizing said dithiophosphoric acid with zinc, barium, cadmium, magnesium or nickel base in the presence of an effective amount of a promoter, said promoter comprising dialkyl dithiophosphoric acid.

21. A lubricating oil composition comprising a major proportion of lubricating oil and about 0.05 to about 5 weight percent of a metal diaryl dithiophosphate, said diaryl dithiophosphate made by a process comprising:

reacting P_2S_5 with a hydroxy aryl compound to form a dithiophosphoric acid; and

neutralizing said dithiophosphoric acid with zinc, barium, cadmium, magnesium or nickel base in the presence of small amounts of a promoter, said promoter comprising dialkyl dithiophosphoric acid.

4,113,635

RUST-PROOF LUBRICANT COMPOSITIONS

Toshio Sakurai, Yokohama; Shoji Shimada, and Yoshiharu Kamimura, both of Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 528,885, Dec. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 314,503, Dec. 13, 1972, abandoned. This application Jul. 30, 1976, Ser. No. 710,312

Claims priority, application Japan, Dec. 13, 1971, 46-100881

Int. Cl.² C10M *3/02, 7/02, 7/20*

U.S. Cl. 252—49.6 **3 Claims**

1. In a rust-proof lubricant composition of the solid-film type which is composed of a major amount of a base oil and not more than 10 percent of at least one member selected from the group consisting of phenol oxidization preventives, amine oxidization preventives, boron oxidization preventives, nonionic, anionic and cationic surface active agents, the improvement which comprises said base oil consisting of the partial ester obtained by the esterification reaction between a fatty acid and pentaerythritol selected from the group consisting of mono, di- and tri-esters, said partial ester being present in an amount of at least about 40% by weight of the composition.

4,113,636

AMINATED POLYMERIC ADDITIVES FOR FUELS AND LUBRICANTS

Lawrence J. Engel, Green Brook, and John B. Gardiner, Mountainside, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Jul. 31, 1974, Ser. No. 493,328

Int. Cl.² C10M *1/32*

U.S. Cl. 252—51.5 R **5 Claims**

1. A composition comprising a major proportion of a lubricating oil and dissolved therein about 0.25 to 10 wt. % of an oil-soluble sludge dispersing, viscosity-index improving product, which is free of haze contributing components comprising:

the reaction product of a polyethylene amine with an oxygen containing, mechanically degraded copolymer of ethylene and one or more C_3 to C_8 alpha-olefins, said copolymer prior to degradation being characterized by:

a. an ethylene content in the range of about 70 to 80 mole percent;

b. a degree of crystallinity of 3 to 25 weight percent as determined by X-ray and differential scanning calorimetry;

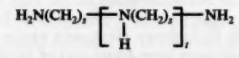
c. a weight average molecular weight (M_w) in the range of about 30,000 to 400,000;

d. a number average molecular weight (M_n) in the range of about 10,000 to 100,000; **and**

e. a range of molecular weights as measured by the ratio of M_w/M_n of 8 or less;

said copolymer being degraded by mechanical working in the absence of solvent and in the presence of air at temperatures in the range of about 250° to 750° F., to thereby incorporate into said copolymer about 0.05 to 2.0 wt. % oxygen, based on the weight of the oxygenated copolymer;

said amine having the general formula:



wherein *s* is 2 and *t* is 2 to 6;

and wherein only 50 to 95% of the oxygenated groups of said oxygenated copolymer are reacted with said amine by heating, whereby less than a stoichiometric amount of said amine is reacted and the presence of excess unreacted amine is avoided to thereby form a haze-free product.

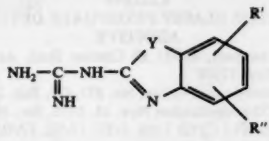
4,113,637

ALKYL-GUANIDINO-HETEROCYCLIC COMPOUNDS, THEIR MANUFACTURE AND USE AS ADDITIVES FOR FUELS AND LUBRICANTS

Choua Cohen, and Bernard Sillion, both of Grenoble, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Division of Ser. No. 608,966, Aug. 29, 1975, Pat. No. 4,071,459.
This application Aug. 1, 1977, Ser. No. 821,054
Claims priority, application France, Sep. 10, 1974, 74 30819
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—51.5 A 15 Claims

1. An alkyl-guanidino heterocyclic compound produced by alkylation at 100°–250° C. with a halogenated hydrocarbon of the general formula RX_n, of a guanidino-heterocyclic compound (A) of the formula:



in which R is a hydrocarbon radical containing about 10 to 200 carbon atoms, X is a halogen atom and *n* is 1 or 2; Y is a —CONH— group in which the carbon atom is directly bound to the benzene ring, R′ and R″ are each a hydrogen atom, or an alkyl radical having from 1 to 10 carbon atoms, or a —Z—Ar group in which Z is —O—, —S—, or alkylene and Ar is aromatic hydrocarbyl or R′ and R″ together when they are in ortho position, represent a carbocyclic ring fused to the benzene ring, the proportion of the reactants being 0.7–2.5 moles of (A) per gm. atom of halogen in RX_n.

7. A lubricating composition comprising a major amount of a mineral oil, and in a sufficient proportion to obtain dispersing properties of at least one compound according to claim 1.

4,113,638

FROTHING COMPOSITION FOR GYPSUM DISPERSIONS

Robert Coleman Taylor, King of Prussia, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 4, 1976, Ser. No. 711,761
Int. Cl.[2] C09K *3/00*
U.S. Cl. 252—61 13 Claims

1. A frothing composition useful for preparing aqueous gypsum dispersions comprising:

(a) about 50 to 95 parts by weight of a first component which is a neutralized alkylaryl sulfonic acid having an average of about 10 to 14 alkyl carbon atoms, and

(b) about 5 to 50 parts by weight of a second component which is a neutralized dipropyl benzene sulfonic acid or a mixture of neutralized alkylbenzene sulfonic acids containing at least 50% by weight of neutralized dipropyl benzene sulfonic acid and having an average alkyl carbon content of about 4.5 to 8 atoms per molecule.

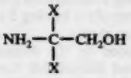
4,113,639

LUBRICATING OIL COMPOSITION CONTAINING A DISPERSING-VARNISH INHIBITING COMBINATION OF AN OXAZOLINE COMPOUND AND AN ACYL NITROGEN COMPOUND

Thorkild F. Lonstrup, Plainfield; Darrell W. Brownawell, Scotch Plains; Edward Goletz, Jr., North Plainfield, and Solomon J. Numair, Edison, all of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 11, 1976, Ser. No. 741,032
Int. Cl.[2] C10M *1/32, 1/50*
U.S. Cl. 252—51.5 A 6 Claims

1. A lubricating oil composition comprising a major amount of lubricating oil and a minor but dispersing amount of a dispersing and varnish inhibiting combination of: (a) one part by weight of an oil-soluble oxazoline reaction product having a number average molecular weight of from about 1,000 to about 3,300 obtained from the reaction of one molar proportion of a hydrocarbyl substituted C_4-C_{10} monounsaturated dicarboxylic acid material wherein said hydrocarbyl substituent contains at least 50 aliphatic carbon atoms, and from about 1.5 to about 2 molar proportions of a 2,2-disubstituted-2-amino-1-alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbons and represented by the formula:



wherein X is an alkyl, or hydroxy alkyl group, with at least one of the X substituents being a hydroxy alkyl group of the structure $—(CH_2)_nOH$, wherein n is 1 to 3; and, (b) from 0.25 to 4 parts by weight of an oil-soluble acylated nitrogen compound having a number average molecular weight ranging from about 1,300 to 8,000 characterized by the presence within its structure of a substantially saturated hydrocarbon-substituted polar group selected from the class consisting of acyl, acylimidoyl, and acyloxy radicals wherein the substantially saturated hydrocarbon substituent contains at least about 50 aliphatic carbon atoms and a nitrogen-containing group characterized by a nitrogen atom attached directly to said polar radical.

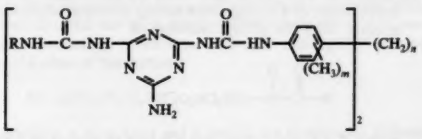
4,113,640

TRIAZINE-UREA GREASE THICKENERS

Thomas F. Wulfers, Hazelcrest, Ill., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 769,252, Feb. 16, 1977, abandoned, which is a division of Ser. No. 635,532, Nov. 26, 1975, Pat. No. 4,026,890. This application Nov. 17, 1977, Ser. No. 852,395
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—51.5 A 10 Claims

1. A grease composition consisting essentially of a major amount of a lubricating oil base vehicle and in an amount sufficient to thicken the base vehicle to grease consistency, a triazine-urea compound defined by the formula:



wherein R is an aliphatic hydrocarbyl radical of 16 to 22 carbon atoms and *m* and *n* are integers of 0–1.

4,113,641

CARRIER PARTICLES HAVING THE SURFACE THEREOF TREATED WITH PERFLUORO SULFONIC ACID AND METHOD OF MAKING THE SAME

George Brana, Bridgeport, and John J. Russell, Woodbury, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Oct. 7, 1977, Ser. No. 840,305
Int. Cl.[2] G03G *9/10, 9/14*
U.S. Cl. 252—62.1 P 5 Claims

1. A carrier for electrophotographic development of latent electrostatic images, comprising particles selected from the group consisting of metal particles and metallic particles, said particles having adhered to the surface thereof a layer of perfluoroalkyl sulfonic acid.

4,113,642

HIGH VISCOSITY NEUTRAL POLYESTER LUBRICANTS

Karlheinz Koch, Haan, and Willi Breitzke, Dusseldorf-Holthausen, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 11, 1976, Ser. No. 741,160
Int. Cl.[2] C10M *3/20*
U.S. Cl. 252—56 S **8 Claims**

1. A high viscosity neutral complex polyester lubricant produced by esterifying a mixture of

(a) a branched alkanepolyol having 2 to 4 primary hydroxyls and 4 to 10 carbon atoms,

(b) polyacids produced by the dimerization and trimerization of unsaturated fatty acids having 16 to 18 carbon atoms, wherein said polyacids are a mixture containing at least 75% of dimeric fatty acids, and

(c) alkanoic acids having 6 to 16 carbon atoms selected from the group consisting of

(1) mixtures of saturated fatty acids having 6 to 12 carbon atoms, and

(2) alkanoic acids having 12 to 16 carbon atoms and having a branched chain in the α-position to the carboxyl group,

in such proportions that the acid number of said polyester is 0.3 or below, the hydroxyl number of said polyester is 0.5 or below, and the proportion of said hydroxyl groups being esterified by said alkanoic acid is from 50% to 90%.

4,113,643

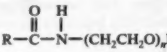
AEROSOL FOAMS

John Thompson, Maidenhead, and Adrian Pitfield, High Wycombe, both of England, assignors to Wilkinson Sword Limited, England

Filed Feb. 27, 1976, Ser. No. 662,266
Claims priority, application United Kingdom, Feb. 27, 1975, 8249/75
The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.
Int. Cl.[2] C11D *17/00*
U.S. Cl. 252—90 **5 Claims**

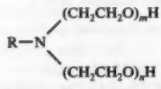
1. An aerosol shaving foam dispenser containing an aqueous soap-free, surfactant concentrate, and emulsified or readily emulsifiable therewith, a gaseous propellant in liquid phase, said concentrate consisting essentially of water and:

(i) from 1 to 15% by weight based on the weight of the concentrate, of a nitrogen-containing synthetic surfactant selected from the group consisting of:



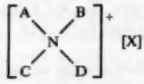
I

where R is C_{12}–C_{18} alkyl; and n is 0 or an integer of from 1–2 inclusive;



II

where R is as above defined and m and n are positive integers whose sum is from 2–9 inclusive; and



III

where A is $(C_3H_6O)_pH$, where p is an integer of from 8–50; X is an anion; and B, C and D are each C_1–C_3 alkyl;

(ii) from 0.5–6.0% by weight, based on the concentrate, of a long chain fatty alcohol containing from 12–18 carbon atoms; and

(iii) from 1–15% by weight based on the concentrate, of an additional surfactant compatible with the nitrogen-containing surfactant and being a water-soluble synthetic surfactant having an HLB value in the range 12–40 and as its hydrophobic part, a straight chain alkyl group of from 12–18 carbon atoms or an alkyl-substituted benzene or naphthalene group containing s straight chain alkyl group of from 5–12 carbon atoms; the weight ratio of components (i) and (iii) together to component (ii) being in the range 0.5:1 to 12:1, and the surfactants being such that the HLB value of the total surfactant component of the concentrate is from 8–18.

4,113,644

PROTECTED GLASSY PHOSPHATE DETERGENT ADDITIVE

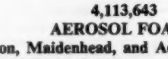
William R. Ashcraft, 16202 El Camino Real, Apt. No. 921, Houston, Tex. 77058

Continuation-in-part of Ser. No. 551,475, Feb. 20, 1975, abandoned. This application Nov. 11, 1975, Ser. No. 631,026
Int. Cl.[2] C11D *3/06, 3/37, 17/00, 17/06*
U.S. Cl. 252—91 **6 Claims**

1. A granular detergent consisting essentially of:

(A) 1 to 15 parts by weight of a detergent additive comprising:

(I) 1% to 90% by weight of a glassy phosphate having a general formula



wherein M is an alkali metal and y is from about 7 to about 12; and

(II) 10% to 99% by weight of a polyethylene glycol having a molecular weight from about 1,400 to about 30,000; and

(B) 85 to 99 parts by weight of detergent granules comprising:

(I) 2% to 35% by weight of a surface-active agent selected from the group consisting of anionic, nonionic, ampholytic, and zwitterionic surface-active materials; and

(II) 10% to 65% by weight of a detergent builder.

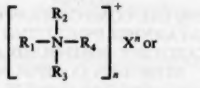
4,113,645

BLEACH COMPOSITIONS CONTAINING PERFUME OILS

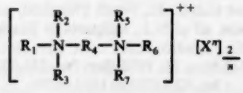
Robert Santora DeSimone, Middletown, N.Y., assignor to Polak's Frutal Works, Inc., Middletown, N.Y.

Filed Jul. 26, 1977, Ser. No. 819,517
Int. Cl.[2] C11D *3/395, 7/54, 9/44*
U.S. Cl. 252—187 H **5 Claims**

1. In an alkali metal hypochlorite bleach solution containing a perfume oil to mask the chlorine odor thereof and a dispersant for said perfume oil, the improvement which comprises said dispersant being at least one quaternary ammonium compound having the structural formula



or



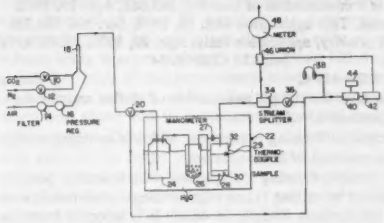
where R_1 is an alkyl or aromatic group containing from about 1 to 20 carbon atoms, R_2 through R_7 are selected from the

group consisting of alkyl and aromatic groups containing about 1 to 14 carbon atoms, cycloalkyl groups containing about 5 to 18 carbon atoms, alkaryl groups containing from 7 to 10 carbon atoms, and pyridyl groups and X is selected from the group consisting of fluoride, chloride, nitrate, sulfate, methyl sulfate, carbonate, sulfonate, chlorate and hydroxide, and n is either 1 or 2 and is equal to the valence of X.

4,113,646
AIR REVITALIZATION COMPOSITIONS

Paul R. Gustafson, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1977, Ser. No. 790,623
Int. Cl.[2] C01B *13/02*; A62B *21/00*
U.S. Cl. 252—184 **4 Claims**



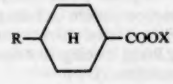
1. In an air-revitalization composition which comprises potassium superoxide, the improvement which comprises, based on the total composition weight, from about 2 to about 10 weight percent of lithium monoxide, from about 0 to about 2 weight percent of silicon dioxide, and a salt selected from the group consisting of calcium sulfate and lithium metaborate, provided that, calcium sulfate is in amount from about 3 to about 8 weight percent and lithium metaborate is in an amount from 5 to 10 weight percent.

4,113,647
LIQUID CRYSTALLINE MATERIALS

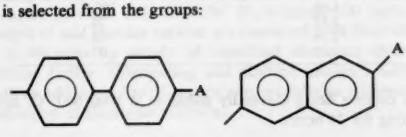
David Coates, Bishops Stortford; George William Gray, Cottingham, and Damien Gerard McDonnell, Hull, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 2, 1977, Ser. No. 821,146
Claims priority, application United Kingdom, Aug. 13, 1976, 33858/76; Mar. 15, 1977, 10839/77
Int. Cl.[2] G02F *1/13*; C09K *3/34*; C07C *69/74, 121/62, 121/64*
U.S. Cl. 252—299 **52 Claims**

1. A liquid crystal material which comprises a trans-4-alkylcyclohexane-1-carboxylic acid ester having the general formula:



where R is a normal or branched chain alkyl group, which may contain a chiral center containing up to ten carbon atoms, and X is selected from the groups:



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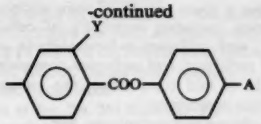


in which A is a cyano group, a normal or branched chain alkyl group, which may also contain a chiral center, containing up to ten carbon atoms, or an alkoxy group in which the alkyl group is as defined immediately above, and where Y is a halogen or hydrogen.

4,113,648
TERBIUM-ACTIVATED RARE EARTH OXYSULFIDE PHOSPHORS WITH CONTROLLED DECAY

John L. Ferri, Towanda; James E. Mathers, and Ramon L. Yale, both of Ulster, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 20, 1974, Ser. No. 525,589
Int. Cl.[2] C09K *11/46*
U.S. Cl. 252—301.4 S **3 Claims**

1. A phosphor composition consisting essentially of a host selected from the group consisting of lanthanum oxysulfide, gadolinium oxysulfide, yttrium oxysulfide, and mixtures thereof and, as an activator, from about 0.0005 to about 0.1 moles of terbium per mole of host and from 1 ppm to about 500 parts by weight per million parts by weight of host of a decay deaccelerator selected from the group consisting of ytterbium and europium.

4,113,649
METHOD FOR THE SOLUBILIZING OF ALKALI METAL SALTS WITH POLYETHYLENEGLYCOLDIETHERS AND THE UTILIZATION THEREOF

Herbert Lehmkuhl, Mülheim, Germany, and Farroch Rabet, Tehran, Iran, assignors to Studiengesellschaft Kohle mbH, Mulheim an der Ruhr, Germany

Filed Aug. 4, 1976, Ser. No. 711,742
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1975, 2534851
Int. Cl.[2] B01F *3/00*
U.S. Cl. 252—363.5 **14 Claims**

1. Process of solubilizing a material which is an alkali metal, an alkali metal salt or an alkaline earth metal salt, which comprises contacting the material with open-chain polyethyleneglycoldiether of the formula

$$RO—[CH_2CH_2O]_nR'$$

wherein $n = 6$ or more and R and R' are identical or different and each is alkyl, aryl or cycloalkyl.

4,113,650
PRODUCING DISPERSANT COMPOSITIONS COMPATIBLE WITH MANY RESIN SYSTEMS

Edgar N. Putman, New Hope; George Patterson, Philadelphia; Scotty Wimer, Bethlehem, and John B. McCool, 3rd, Ottsville, all of Pa., assignors to PFD/Penn Color, Inc., Doylestown, Pa.

Continuation of Ser. No. 340,453, Mar. 12, 1973, Pat. No. 3,959,193. This application Aug. 4, 1975, Ser. No. 601,628
The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.
Int. Cl.[2] B01F *3/00*
U.S. Cl. 252—363.5 **1 Claim**

1. A method of producing cellulose acetate butyrate containing dispersant compositions which are compatible with many commercially significant, preselected final resin systems, comprising the steps of,

(a) providing a given weight of resin additive dispersant composition consisting essentially of cellulose acetate butyrate, aryl sulfonamide-formaldehyde resin, and a nonionic surfactant, said surfactant comprising up to 1% by weight of said composition, the remainder of said composition comprising:

(i) said cellulose acetate butyrate, and

(ii) said aryl sulfonamide-formaldehyde resin in a weight ratio (ratios of (i) to (ii)) from 80:20 to 30:70, and

(b) mixing said resin additive into said resin additive dispersant composition in a ratio from two-thirds to nine times said given weight of resin additive dispersant composition, to produce a dispersed resin additive composition, exhibiting compatibility with said preselected final resin systems.

4,113,651
MANUFACTURE OF A METAL IMPREGNATED CARBON FROM PEAT MATERIAL

Esteban Chornet, Sherbrooke, Canada, and Jean-Claude Cavalier, Biarritz, France, assignors to Universite de Sherbrooke, Canada

Filed Jun. 29, 1977, Ser. No. 811,438

Claims priority, application Canada, May 18, 1977, 278700

Int. Cl.[2] B01J *21/18*; C01B *31/12*; B01J *37/02*

U.S. Cl. 252—422 **5 Claims**

1. In a process for preparing a finely divided carbon supported metal catalyst by pyrolyzing a dried metal impregnated ammoniated peat, the improvement which comprises treating dried peat with gaseous ammonia at a temperature of between 45° and 80° C., thereby producing an ammoniated peat characterized by a higher ion exchange capacity than the unammoniated peat, contacting said ammoniated peat with a metal salt solution to produce metal impregnated ammoniated peat having a metal content higher than the normal saturation capacity of unammoniated peat with said metal.

2. A process according to claim 1 wherein the dried peat has a moisture content of 10 to 15%.

3. A process according to claim 1 wherein the pyrolysis is carried out at about 500° to 800° C., in the presence of an inert gas.

4,113,652
OXYGEN ABSORBENT

Yoshio Yoshikawa, Ushiku; Akira Amemiya; Toshio Komatsu, both of Tokyo; Yoshiaki Inoue, Iizuka, and Megumu Yuyama, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Dec. 17, 1976, Ser. No. 751,668

Claims priority, application Japan, Dec. 25, 1975, 50-156923; Feb. 4, 1976, 51-11126

Int. Cl.[2] B01J *31/02, 27/14, 27/24, 27/02*

U.S. Cl. 252—428 **11 Claims**

1. An oxygen absorbent consisting essentially of at least one alkaline earth metal sulfite, at least one ferrous salt and free water, the amount of the free water being from about 2 to about 200 parts by weight per 100 parts by weight of the combined weight of the sulfite and the ferrous compound, and the amount of the ferrous salt being from about 0.1 part to about 150 parts by weight of the sulfite.

4,113,653
POLYMERIZATION OF α-PINENE

Erwin Richard Ruckel, Darien, and Long Shyong Wang, Greenwich, both of Conn., assignors to Arizona Chemical Company, Wayne, N.J.

Division of Ser. No. 613,777, Sep. 16, 1975, Pat. No. 4,057,682. This application Jul. 11, 1977, Ser. No. 814,527

Int. Cl.[2] C08F *4/14*

U.S. Cl. 252—429 B **5 Claims**

1. A polymerization catalyst system which comprises:

(a) a major amount ranging from 2 to 10%, by weight, of aluminum chloride, aluminum bromide or mixtures of the same, and

(b) a minor amount ranging from 0.08 to 0.1%, by weight, of an alkyl germanium halide or an aryl germanium halide in admixture with from 0.4 to 1.0%, by weight, of an alkyl halide, alkenyl halide or aralkyl halide, said percentages being based on the weight of monomer to be polymerized.

4,113,654
CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Adolfo Mayr, Ferrara; Velmore Davoli, Reggio Emilia; Antonio Leccese, and Ermanno Susa, both of Ferrara, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation of Ser. No. 505,901, Sep. 13, 1974, abandoned, which is a continuation of Ser. No. 245,665, Apr. 19, 1972, abandoned. This application Oct. 18, 1976, Ser. No. 733,709

Claims priority, application Italy, Apr. 20, 1971, 23399 A/71

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 C **3 Claims**

1. A catalyst for the polymerization of olefins and the starting components of which comprise

(A) a catalyst-forming component which is an organometallic compound of aluminum and

(B) a catalyst-forming component which is the product obtained by mixing (1) an organic magnesium halide having the formula RMgX, in which R is selected from the group consisting of alkyl, aryl, aralkyl and alkyl-aryl radicals and X is a halogen atom, and (2) a halogenated titanium compound selected from the group consisting of halides, oxyhalides, haloalcoholates, halotitanates, said catalyst-forming component (B) containing from 0.05% to 10% by weight of titanium.

4,113,655
CATALYST OF CHLORINATION AND COMBINED CHLORINATION/FLUORINATION BASED ON COPPER/CALCIUM/FLUORIDE

Wim J. M. Pieters, Morristown, and Emery J. Carlson, Chatham, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 683,995, May 6, 1976, Pat. No. 4,039,596. This application Apr. 28, 1977, Ser. No. 791,767

Int. Cl.[2] B01J *27/24, 27/12*

U.S. Cl. 252—438 **6 Claims**

1. Catalyst effective for oxidation, by elemental oxygen, of hydrogen chloride accompanied by chlorination of organic material or by such chlorination together with fluorination with hydrogen fluoride, which catalyst consists essentially of a calcium fluoride matrix and a thermally stable phase containing copper ion, calcium ion, and alkali metal or ammonium ion in combination with fluoride ion, which phase is herein referred to to as the "A phase"; said catalyst having Debye-Scherrer X-ray diffraction pattern including lines characteristic of calcium fluoride and lines, characteristic of the A phase, having the following Bragg spacings in Angstrom units and the following relative intensities (I/I^1):

Bragg spacings	Relative intensities
4.68	100
2.87	70
2.34	50
2.03	55

said catalyst being thermally stable to at least 600° C. upon heating for 24 hours.

4,113,656

HYDROTREATING CATALYST AND PROCESS UTILIZING THE SAME

Kenneth L. Riley, Baton Rouge, and Lloyd A. Pine, Greenwell Springs, both of La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 644,835, Dec. 29, 1975, Pat. No. 4,069,139. This application Feb. 28, 1977, Ser. No. 773,427

Int. Cl.[2] B01J *21/04, 21/12, 23/24, 23/74*

U.S. Cl. 252—439 9 Claims

1. A catalyst comprising an alumina support composited with a hydrogenation component comprising at least one Group VIB metal component selected from the group consisting of at least one elemental metal, metal oxide or metal sulfide of a Group VIB element of the Periodic Table of Elements and at least one Group VIII metal component selected from the group consisting of at least one elemental metal, metal oxide or metal sulfide of a Group VIII metal of the Periodic Table of Elements, said catalyst having a median pore radius ranging from about 70 to about 95 Angstroms, a total pore volume between 0.45 and 1.50 ml/g; less than 0.05 ml/g of said pore volume being in pores with radii greater than 100 Angstroms; at least 0.40 ml/g of said pore volume being in pores with radii in the range between said median pore radius to about 10 Angstroms above and 10 Angstroms below said median pore radius; at least 75 percent of said pore volume being in pores with radii in the range between said median pore radius to about 10 Angstroms above and 10 Angstroms below said median pore radius; less than 0.05 ml/g of said pore volume being in pores with radii below 60 Angstroms, and a total surface area ranging between 130 and 500 square meters per gram.

4,113,657

ALKYLATION PROCESS

Sheldon Herbstman, Spring Valley; Allen N. Webb, and John H. Estes, both of Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 604,586, Aug. 14, 1975, Pat. No. 4,066,716. This application Dec. 2, 1976, Ser. No. 746,766

Int. Cl.[2] B01J *27/10*

U.S. Cl. 252—442 8 Claims

1. An alkylation catalyst consisting essentially of alumina and chlorine prepared by contacting an active chlorided alumina catalyst comprising from about 3.0 to 15.0 weight percent chlorine, said alumina catalyst being prepared by contacting alumina with a chlorinating agent under non-reducing conditions, wherein said alumina catalyst is initially contacted at a temperature of between 700° and 1200° F. in an oxidizing atmosphere and thereafter with aluminum chloride at a temperature between 300° and 650° F., wherein 100 parts by weight of said alumina catalyst are contacted with from about 2 to 40 parts by weight of vaporized aluminum chloride thereby further chlorinating said alumina catalyst's surface with an additional 2 to 15 weight percent chlorine without the deposition of aluminum chloride.

4,113,658

PROCESS FOR HOMOGENEOUS DEPOSITION PRECIPITATION OF METAL COMPOUNDS ON SUPPORT OR CARRIER MATERIALS

John W. Geus, Geleen, Netherlands, assignor to Stamicarbon, N.V., Geleen, Netherlands

Continuation of Ser. No. 361,492, May 18, 1973, abandoned, which is a continuation of Ser. No. 108,081, Jan. 20, 1971, abandoned, and a continuation-in-part of Ser. No. 721,051, Apr. 12, 1968, abandoned, Ser. No. 743,000, Jul. 8, 1968, abandoned, Ser. No. 814,703, Apr. 9, 1969, abandoned, Ser. No. 858,318, Sep. 16, 1969, abandoned, Ser. No. 886,693, Dec. 19, 1969, abandoned, Ser. No. 879,625, Nov. 24, 1969, abandoned, and Ser. No. 577, Jan. 5, 1970, Pat. No. 3,654,161. This application Mar. 2, 1976, Ser. No. 663,106

Claims priority, application Netherlands, Apr. 14, 1967, 6705259; Aug. 31, 1967, 6712004

Int. Cl.[2] B01J *21/08, 21/06, 21/04;* C04B *35/00*

U.S. Cl. 252—454 5 Claims

1. A process for the preparation of a particulate at least inchoately catalytically active composition affixed to the surfaces of a solid particulate supporting material which comprises the combination of steps of:

(A) forming a body of a solution-suspension aqueous medium by admixing

(1) a solution of at least one metal compound and wherein said metal is Bi(III), Co(II), Cr(III), Fe(II), Mo(VI), Ni(II), Sn(IV) or Pt(IV) which compound is:

(a) substantially soluble in said aqueous medium within at least a range of pH value below a pre-determined pH value of less than about 7: and

(b) said at least one metal is capable of forming an insoluble compound at a pH above said range; and

wherein said solution of said compound contains up to 15% by weight of the metal ion of said metal compound; and

(2) a finely divided stable particulate solid, nucleating surface providing supporting material which is SiO_2, Al_2O_3, or TiO_2 and which has a sedimentation rate sufficiently low to permit homogeneous distribution thereof in said solution under the agitated conditions during the process and to form a suspension under said agitated conditions in said solution; the particles thereof having a surface which, under the conditions of the process is a nucleating surface with respect to said insoluble compounds; and

(b) initially controlling and adjusting the pH of said aqueous medium to a value within said pH range within which said compound is substantially soluble in said aqueous medium;

(C) sufficiently vigorously agitating the resulting aqueous medium so that said suspension particles are homogeneously distributed throughout said body, along with said dissolved at least one metal compound; while also

(D) increasing the total hydroxyl ion concentration within said agitated suspension-solution, wherein the total hydroxyl ion concentration is

(a) at a level sufficiently high to initiate nucleation and deposition precipitation of said insoluble compound on and over the said surface of the said particulate supporting material itself, but

(b) below that concentration at which the total hydroxide ion concentration and the total concentration of ions of said metal exceed the solubility product of that insoluble compound of step (A) (1) (b) in said suspension-solution and thus at a level insufficient to induce any substantial free nucleation of said insoluble compound within the solution phase per se and with rapid dilution and distribution of any local momentary incremental increase of hydroxyl-ion wherein the step of increasing the hydroxyl-ion concentration is effected

by introducing a hydrolizable agent into said solution, which hydrolizable agent will, under the conditions of the process, hydrolize to form hydroxyl ions, and hydrolizing said agent to form said hydroxl ions during the

process under controlled and gradual conditions; wherein the control of said hydrolysis is essentially effected by controlling the temperature of said solution at a level whereat the required and desired rate of hydrolysis, under the conditions of the process, take place, wherein said temperature can be up to 100° C., and

(E) continuing increasing total hydroxyl-ion concentration as in step (D) until the desired amount of insoluble metal compound has been transferred from said solution to said supporting material, wherein the rate of said further increases in said total hydroxyl ion concentration is maintained substantially at the level of the rate of migration of said metal to the said surface of said supporting material; and thereafter separating said solid supporting materials, having said insoluble compound substantially homogeneously deposited thereon, from the remaining aqueous solution of the said aqueous medium.

2. The process of claim 1, wherein said solution contains 5 to 15% by weight of metal ion of said water-soluble salt.

3. The process of claim 1, wherein said hydrolizable agent is introduced into said solution-suspension in an amount of 1 to 10 times the theoretical quantity required to convert said water-soluble salt to said insoluble metal compound.

4. The process of claim 3, wherein said hydrolizable agent is urea, acetamide or hydrolizable derivatives thereof.

4,113,659

CATALYTIC COMPOSITE AND METHOD OF MANUFACTURE

Edward Michalko, Chicago, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 671,893, Mar. 29, 1976, abandoned, and Ser. No. 671,895, Mar. 29, 1976, abandoned. This application Apr. 11, 1977, Ser. No. 786,527

Int. Cl.[2] B01J *29/06;* **C07C** *3/00, 3/58*

U.S. Cl. 252—455 Z **19 Claims**

1. A catalytic composite comprising a calcined mixture of a refractory inorganic oxide and a zeolite of the mordenite crystal structure containing less than about 5 wt. % sodium as Na_2O, said zeolite having been treated with an aqueous ammoniacal base solution at a pH of at least about 9.5 in admixture with said refractory inorganic oxide in a substantially acid anion-free state, said zeolite being in from about a 1:3 to about a 3:1 weight ratio with said refractory inorganic oxide.

10. A method of manufacture providing a catalytic composite of improved activity which comprises subjecting a zeolite of the mordenite crystal structure, and containing less than about 5 wt. % sodium as Na_2O, to an aqueous ammoniacal treatment of a pH of at least about 9.5 in admixture with a substantially acid anion-free refractory inorganic oxide to form a catalytic composite therewith.

4,113,660

PRODUCTION OF SHAPED CATALYSTS OR CARRIERS COMPRISING TITANIUM OXIDES

Kazunobu Abe, Izumi; Hiroaki Rikimaru, Nara; Iwao Yamazaki, and Hiroshi Hasegawa, both of Osaka, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Sakai, Japan

Filed Dec. 22, 1976, Ser. No. 753,323

Claims priority, application Japan, Dec. 23, 1975, 50-154606; Jul. 26, 1976, 51-89429; Aug. 24, 1976, 51-101350

Int. Cl.[2] B01J *21/04, 21/06, 21/08, 23/22*

U.S. Cl. 252—455 R **17 Claims**

1. A process for preparing shaped catalysts or carriers mainly containing titanium oxide which comprises calcining a material mainly comprising titanium oxide or a substance convertible into titanium oxide on calcination in the presence of metatitanic acid sol or gel, said metatitanic acid sol being the one prepared by deflocculation of metatitanic acid obtained in the course of the production of titanium oxide according to a conventional sulfuric acid process and said metatitanic acid gel being the one prepared by adjusting said metatitanic acid sol to pH 1 or higher.

4,113,661

METHOD FOR PREPARING A HYDRODESULFURIZATION CATALYST

Paul Whitfield Tamm, Greenbrae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 387,100, Aug. 9, 1973. This application Aug. 12, 1974, Ser. No. 496,788

Int. Cl.[2] B01J *21/04, 23/84, 23/88*

U.S. Cl. 252—465 **5 Claims**

1. A method for preparing a hydrocarbon hydrodesulfurization catalyst which comprises impregnating a porous carrier with an aqueous solution containing at least one catalytic agent or catalytic agent precursor selected from the group consisting of Group VIB and Group VIII iron group compounds, said compounds being thermally decomposable to the metal oxides and thereafter drying and calcining the resulting impregnated carrier, said carrier having been prepared by

(a) treating a peptizable particulate solid comprising predominantly alpha-alumina monohydrate sized in the range below about 500 microns by admixing the solid with an aqueous solution of at least one acid selected from the group consisting of nitric, hydrochloric, hydrofluoric and hydrobromic acids, said solution containing an amount of the acid in the range from about 0.05 to 0.20 equivalent per formula weight of the alumina;

(b) neutralizing at least a portion of the admixed acid by admixing into the treated solid an aqueous solution of a nitrogen base, said base having the formula R_3N or R_3NHOH, wherein said R groups are the same or different and are selected from the group consisting of hydrogen and of alkyl groups having a carbon atom content in the range from one to three inclusive, said solution containing an amount of the base in the range from about 0.6 to 1.2 equivalents per equivalent of said acid;

(c) shaping the neutralized or partially neutralized solid; and

(d) completing the carrier by drying and calcining the shaped solid in a dry or humid atmosphere at a temperature in the range from about 150° to 1700° F.;

and said carrier being substantially free of pores having a pore diameter above 1000 Angstroms, and having a pore volume of at least 0.5 cc/g in which at least 70% of said pore volume constitutes pores having a pore diameter in the range between 80 and 150 Angstroms.

4,113,662

CATALYST FOR ESTER HYDROGENATION

Robert G. Wall, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 711,909, Aug. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 578,799, May 19, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,366

Int. Cl.[2] B01J *23/72, 23/80, 27/20*

U.S. Cl. 252—473 **9 Claims**

1. A catalyst suitable for use in the hydrogenation of carboxylic acid esters the metal components of which are not fused and consist essentially of the elemental, oxide, hydroxide, or carbonate form of cobalt, zinc, and copper.

4,113,663

2-ETHYL-6,6-DIMETHYL-2-CYCLOHEXENE-1-CARBOXYLIC ACID ETHYL ESTER PERFUME COMPOSITIONS

Hanspeter Schenk, Zumikon, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Filed Oct. 4, 1976, Ser. No. 729,521

Claims priority, application Switzerland, Oct. 9, 1975, 13117/75; Jul. 27, 1976, 9584/76; Sep. 23, 1976, 12073/76

Int. Cl.[2] C11B 9/00

U.S. Cl. 252—522 4 Claims

1. A perfume composition which contains an olfactorily-effective amount of damascone-like 2-ethyl-6,6-dimethyl-2-cyclohexene-1-carboxylic acid ethyl ester and at least one other olfactory agent.

4,113,664

2,4-DIOXA-SPIRO(5,5)UNDEC-8-ENE PERFUME COMPOSITIONS

Jens Conrad, Hilden, and Klaus Bruns, Krefeld-Traar, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

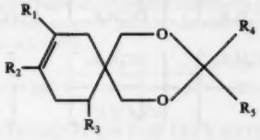
Filed Feb. 4, 1977, Ser. No. 765,531

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1976, 2604553

Int. Cl.[2] C11B 9/00

U.S. Cl. 252—522 28 Claims

1. A perfumery composition consisting essentially of from 1 to 50% by weight of a 2,4-dioxa-spiro(5,5)undec-8-ene of the formula



wherein R_1, R_2 and R_3 are members selected from the group consisting of hydrogen and methyl, R_4 is a member selected from the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms, methoxy, ethoxy, vinyl and 1-propenyl, R_5 is a member selected from the group consisting of hydrogen and alkyl having 1 to 4 carbon atoms, and R_4 and R_5 taken together are $-(CH_2)_n-$ where n is an integer from 4 to 6, and the remainder, customary constituents of perfumery compositions.

4,113,665

COATINGS PREPARED FROM TRIALKOXYSILANES

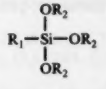
Gabriel H. Law, Rancho Palos Verdes, and Albert Peter Gysegem, Monrovia, both of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Filed Feb. 3, 1977, Ser. No. 765,223

Int. Cl.[2] C08G 77/00

U.S. Cl. 260—37 SB 49 Claims

1. A binder for chemically resistant coatings, wherein the major portion of the binder is prepared by reacting in the presence of an aqueous acidic solution (i) trialkoxysilanes having the formula



where R_1 is selected from the group consisting of alkyl, aryl and cycloalkyl groups containing up to about 6 carbon atoms and where each R_2 is independently selected from the group consisting of alkyl, hydroxyalkyl, alkoxyalkyl and hydroxyalkoxyalkyl groups containing up to about 6 carbon atoms, and (ii) aliphatic polyols containing an average of at least two carbon bonded hydroxy groups per polyol and having an average molecular weight of at least 62, wherein the weight ratio of silanes to polyols is from about 5:1 to about 20:1.

4,113,666

METHOD FOR PRODUCING STRONG-ACID CATION EXCHANGE FIBER BY TREATING FIBROUS POLYETHYLENE WITH GASEOUS SULFUR TRIOXIDE

Takezo Sano, Takatsuki; Akira Kobayashi, Ibaragi, and Haruo Inoue, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 24, 1976, Ser. No. 699,255

Int. Cl.[2] C08F 28/00

U.S. Cl. 521—29 9 Claims

1. A process for producing strongly acidic cation-exchange fiber, which comprises charging fibrous polyethylene in a reactor and passing a gas comprising gaseous sulfur trioxide and an inert gas through said reactor to treat said fibrous polyethylene with said gaseous sulfur trioxide, while agitating the fibrous polyethylene by rotating the reactor.

4,113,667

FLAME RESISTANT POLYURETHANE FOAM AND PROCESS FOR PRODUCING THE SAME

Shigeo Mori, and Takeshi Fujita, both of Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 440,622, Feb. 7, 1974, abandoned. This application Sep. 25, 1975, Ser. No. 616,722

Claims priority, application Japan, Feb. 8, 1973, 48-15863; Mar. 15, 1973, 48-30704; Mar. 24, 1973, 48-33699; Mar. 26, 1973, 48-34883; Mar. 31, 1973, 48-37114; Apr. 1, 1973, 48-38050

Int. Cl.[2] C08G 18/32, 18/38

U.S. Cl. 521—163 25 Claims

1. A process for producing a flame resistant soft polyurethane foam comprising reacting a mixture of

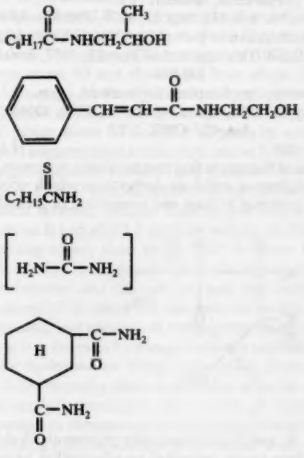
(a) a polyetherpolyol or a polyesterpolyol, each having at least two active hydrogen atoms,

(b) a polyisocyanate,

(c) at least one foaming agent,

(d) a catalyst and about 0.1 to 5 parts by weight of the polyetherpolyol or polyesterpolyol of an amine component comprising

(e) an amine compound selected from the group consisting of



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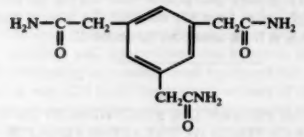
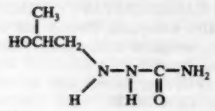
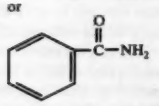




or



4,113,668

ALKYL VINYL COPOLYMER

Cleve H. Forward, 1803 Duquain, and Jerry G. Higgins, Sterling City Rte., both of Big Spring, Tex. 79720

Division of Ser. No. 552,560, Feb. 24, 1975, Pat. No. 3,957,911. This application Feb. 4, 1976, Ser. No. 655,205

Int. Cl.[2] C08J 9/18

U.S. Cl. 521—60 15 Claims

1. A random suspension copolymer suitable for molding consisting essentially of from about 0.25 to about 15% by weight of a 1-olefin monomer having from 14 to 60 carbon atoms and the balance of a vinyl aromatic compound prepared by forming a suspension of said 1-olefin and said vinyl aromatic compound in an admixture of water, a suspending agent, a free radical polymerization catalyst, and optionally a surfactant, with agitation, and then copolymerizing said 1-olefin and said vinyl aromatic compound at a temperature of from about 90° to 125° C. for a period of time sufficient to form small hard copolymer beads having a size of from about 30 to 100 mesh.

4,113,669

POLYMERS FLAMEPROOFED WITH 1,2-OXAPHOSPHOLANES

Helmut Zondler, Bottmingen; Emil Saladin, Augst, and Rudolf Kirchmayr, Münchenstein, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

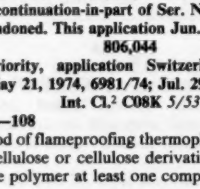
Division of Ser. No. 615,455, Sep. 22, 1975, Pat. No. 4,045,518, which is a continuation-in-part of Ser. No. 499,888, Aug. 23, 1974, abandoned. This application Jun. 13, 1977, Ser. No. 806,044

Claims priority, application Switzerland, Sep. 7, 1973, 12890/73; May 21, 1974, 6981/74; Jul. 29, 1974, 10465/74

Int. Cl.[2] C08K 5/53

U.S. Cl. 521—108 11 Claims

1. A method of flameproofing thermoplastic polymers, polyurethanes, cellulose or cellulose derivatives which comprises adding to the polymer at least one compound of formula I



(I)

wherein

each of R_1, R_2 and R_3 independently represents alkyl with 1 to 18 carbon atoms, haloalkyl or alkoxyalkyl having not more than 18 carbon atoms, alkenyl with 3 to 12 carbon atoms, tetrahydrofurfuryl, aralkyl with 7 to 15 carbon atoms, or aralkyl with altogether 7 to 15 carbon atoms which is substituted by halogen or alkoxy of 1 to 4 carbon atoms, R_4 represents hydrogen or methyl, R_5 represents hydrogen, alkyl with 1 to 8 carbon atoms, aryl with 6 to 10 carbon atoms, aryl with 6 to 10 carbon atoms which is substituted by halogen, alkyl or alkoxy groups with 1 to 4 carbon atoms or represents 2-furyl, 2-thienyl or 2-pyridyl, R_6 represents hydrogen, methyl or phenyl, and R_7 represents alkyl with 1 to 8 carbon atoms, aryl with 6 to 10 carbon atoms, aryl with 6 to 10 carbon atoms which is substituted by halogen, alkyl or alkoxy groups with 1 to 8 carbon atoms or represents 2-furyl, 2-thienyl or 2-pyridyl.

4,113,670

CURABLE ARYLOXYPHOSPHAZENE POLYMERS

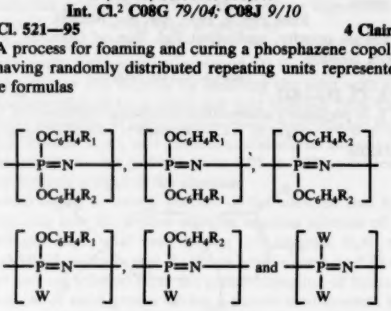
Ronald L. Dieck; Alan B. Magnusson, and Edwin J. Quinn, all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 768,603, Feb. 14, 1977. This application Feb. 17, 1978, Ser. No. 878,679

Int. Cl.[2] C08G 79/04; C08J 9/10

U.S. Cl. 521—95 4 Claims

1. A process for foaming and curing a phosphazene copolymer having randomly distributed repeating units represented by the formulas



wherein R_1 is linear or branched C_1 to C_{10} alkoxy, R_2 is hydrogen, linear or branched C_1-C_{10} alkyl or halogen, and W represents a monovalent radical containing a group capable of a crosslinking chemical reaction at moderate temperatures, said group being attached to a P atom by a -O- linkage, which process comprises mixing said phosphazene copolymer with a chemical blowing agent and a sulfur-type curing agent and heating the resulting mixture to a temperature sufficient to decompose said blowing agent and cure the copolymer.

4,113,671

CARBAMATE-PHOSPHONATES AS FLAME-PROOFING AGENTS IN POLYURETHANE FOAM

Serge L. Lecolier, Janville sur Juine, and Jean-Marie J. Biehler, Brunstatt, both of France, assignors to Societe Nationale des Poudres et Explosifs, France

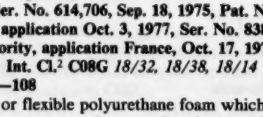
Division of Ser. No. 614,706, Sep. 18, 1975, Pat. No. 4,077,964. This application Oct. 3, 1977, Ser. No. 838,460

Claims priority, application France, Oct. 17, 1974, 74 34948

Int. Cl.[2] C08G 18/32, 18/38, 18/14

U.S. Cl. 521—108 7 Claims

1. A rigid or flexible polyurethane foam which contains, as flameproofing agent, a carbamate-phosphonate of the formula:



wherein R_1 and R_2 are the same or different and are linear or branched alkyl or hydroxyalkyl radicals containing 2 or 3

carbon atoms or R_1 or R_2 together with the nitrogen atom to which they are attached form a 5 or 6 member ring containing one nitrogen atom and 4 or 5 carbon atoms, or R_1 is phenyl and R_2 is hydrogen.

4,113,672

MOLDING EXPANDABLE STYRENE POLYMER PARTICLES

Walter O. Pillar, Monroeville, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 744,571, Nov. 24, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 848,972

Int. Cl.² C08V *9/18*

U.S. Cl. 521—60 **8 Claims**

1. In a process for making styrene polymer particles less flammable by impregnating the polymer particles by heating in aqueous suspension in the presence of a non-polymeric organic halogen compound and a blowing agent at temperatures between 100° C and 125° C, the improvement comprising adding, prior to heating for the impregnation, about 0.001 to 0.50 percent by weight, based on polymer particles, of a tin compound selected from the group consisting of dialkyl tin maleate, dialkyl tin fumarate and mixtures of these wherein the alkyl group may contain 1–20 carbon atoms and a synergistic amount of from 0.001 to 0.40 percent by weight based on polymer particles, of a hindered phenolic antioxidant consisting essentially of an alkylated phenol where said alkyl groups contain from 3 to 20 carbon atome and at least one such alkyl group is in the position ortho to the Hydroxy group of the phenol, whereby the polymer molecular weight is not degraded during the aqueous impregnation process and, whereby expandable styrene polymer particles having improved molding properties are made.

4,113,673

COATING COMPOSITION FOR LEAK DETECTION IN AIR TEST

Nobuyoshi Hirota, and Akio Shibata, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1977, Ser. No. 775,328

Claims priority, application Japan, Mar. 18, 1976, 51/28637; Apr. 19, 1976, 51/43590

Int. Cl.² C08L *89/00*

U.S. Cl. 260—8 **7 Claims**

1. A coating composition for leak detection in an air test, comprising an aqueous solution containing from 1.6 to 9.6 percent by weight soluble starch, from 0.04 to 0.75 percent by weight water-soluble acrylic resin, from 0.05 to 0.5 percent by weight gelatin, and from 0.5 to 1.0 percent by weight a foaming agent, and said solution having a pH range between 4 and 10.

4,113,674

POLY-2-ALKYL-2-OXAZOLINE MODIFIED REGENERATED CELLULOSICS

Stephen L. Miller, and Yancey J. Dickert, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 27, 1976, Ser. No. 754,730

Int. Cl.² C08L *1/24*

U.S. Cl. 260—9 **17 Claims**

1. A modified, regenerated cellulosic comprising regenerated cellulose and at least one weight percent of a poly-2-alkyl-2-oxazoline having a weight average molecular weight of at least about 10,000, the poly-2-alkyl-2-oxazoline being an integral part of the cellulosic.

4,113,675

METHYLOLATED KRAFT LIGNIN POLYMER RESIN

Michael R. Clarke, Aylmer, and Allan J. Dolenko, Ottawa, both of Calif.X, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 20, 1976, Ser. No. 752,628

Claims priority, application Canada, Jan. 13, 1976, 243397

Int. Cl.² C08H *5/02*; C08G *8/24*

U.S. Cl. 260—17.5 **22 Claims**

1. A process for producing a highly cross linkable methylolated kraft lignin resin which comprises reacting kraft or soda lignin under alkaline conditions with a methylolating agent to thereby produce methylolated lignin and subsequently mixing said methylolated lignin with a phenolic cross linking agent and providing a pH below 7 to produce an intimately associated resin complex of methylolated lignin and phenolic cross linking agent curable at elevated temperature.

4,113,676

AQUEOUS DISPERSIONS OF ESTERS STABILIZED WITH CARBODIIMIDES

Kenneth W. Niederst, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 31, 1977, Ser. No. 801,673

Int. Cl.² C08G *18/83, 63/76*; C08K *5/29*

U.S. Cl. 260—22 T **19 Claims**

1. A method for stabilizing aqueous dispersions of organic ester-containing compositions against degradation which comprises adding to said aqueous dispersion a stabilizing amount of a monocarbodiimide.

4,113,677

POLISHED COMPOSITION CONTAINING MICROCRYSTALLINE WAX

Stanley Svedas, and Champak C. Shah, both of Chicago, Ill., assignors to Turtle Wax, Inc., Chicago, Ill.

Filed Jan. 14, 1976, Ser. No. 649,078

Int. Cl.² C08L *7/02*

U.S. Cl. 260—23 R **17 Claims**

1. A polish having a controlled rate of evaporation and capable of withstanding large differentials in temperature which is applicable to an automobile finish as a dilute solution in hot water, said polish comprising an aminofunctional silicone and a dimethyl silicone fluid present in a combined amount of from about 3 to about 6 parts by weight with the aminofunctional silicone being present in an amount not less than 0.1 parts by weight and the dimethyl silicone fluid being present in an amount not less than 0.1 parts by weight; from about 0.8 to about 1.4 parts by weight of an emulsifiable microcrystalline wax; from about 6 to about 16 parts by weight of a mineral oil having an SSU viscosity at 100° F. in the range between about 40 and about 100; from about 13 to about 31 parts by weight of an aliphatic hydrocarbon having an initial boiling point of about 375° F. and an end boiling point of about 500° F.; from about 0.1 to about 10 parts by weight of dicoco dimethyl ammonium chloride; from about 0.1 to about 3.5 parts by weight ethomeen acetate; from about 0.1 to about 3 parts by weight of a metal stearate selected from the class consisting of aluminum stearate, calcium stearate and magnesium stearate; from about 0.1 to about 2 parts by weight of ethoxylated phenol wetting agent; from about 0.015 to about 1.125 parts by weight of a cyclized rubber; and the balance water; the ratio by weight between said silicones and said wax being in the range from about 2.5 to about 4.1; the ratio by weight between said silicones and said mineral oil being in the range from about 0.3 to about 0.5; the ratio by weight between said silicones and said aliphatic hydrocarbon being in the range from about 0.15 to about 0.23; whereby there is provided a polish having a controlled rate of evaporation and capable of withstanding large differentials in temperature which is applicable to an automobile finish as a dilute solution in hot water to provide a protec-

tive coating having high detergent and wear resistance and a deep luster.

4,113,678

TIN SULFIDE STABILIZER FOR STYRENE POLYMER

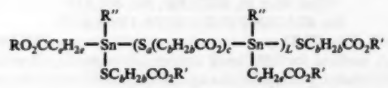
Motonobu Minagawa, Koshigaya; Toshio Ohzeki, Urawa, and Tetsuo Sekiguchi, Hasuda, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Jun. 14, 1977, Ser. No. 806,521
Claims priority, application Japan, Jun. 14, 1976, 51-69455
Int. Cl.² C08K 5/58
U.S. Cl. 260—23.7 M **24 Claims**

1. A sulfide compound of four-valent tin having linked to tin through carbon from 1 to 2 alkoxycarbonylalkylene groups having 1 to 8 carbon atoms in the alkoxy group and 2 to 3 carbon atoms in the alkylene group, and directly linked to tin at least one bivalent sulfide group, represented by one of the formulae

$$[S_a(C_bH_{2b}CO_2)_cSn_d(C_eH_{2e}CO_2R)_2]_n$$

and



in which R is an alkyl group having from 1 to 8 carbon atoms, R′ is a hydrocarbon group having from 4 to 18 carbon atoms, R″ is $-C_eH_{2e}CO_2R$ or $-SC_bH_{2b}CO_2R'$ *a* is an integer from 1 to 4, *b* is 1 or 2, *c* is 0 or 1, *d* is 1 or 2, *e* is 2 or 3, *n* is from 1 to about 100 and L is a number from 1 to 10, provided that when *d* is 2, *a* is at least 3.

4,113,679

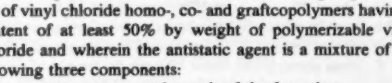
ANTISTATIC THERMOPLASTIC MOLDING COMPOSITIONS AND SHAPED ARTICLES MADE THEREFROM

Hans-Joachim Andrascheck, and Rainer Mucke, both of Burgkirchen, Alz, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 8, 1976, Ser. No. 721,276
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1975, 2540655
Int. Cl.² C08K 5/19
U.S. Cl. 260—28.5 D **1 Claim**

1. Antistatic thermoplastic molding composition wherein the thermoplastic material is selected from the group consisting of vinyl chloride homo-, co- and graftcopolymers having a content of at least 50% by weight of polymerizable vinyl chloride and wherein the antistatic agent is a mixture of the following three components:

A. a quaternary ammonium salt of the formula



B. glycerol monooleate in an amount of 70% by weight and glycerol dioleate in an amount of 30% by weight; and

C. wax OP;

component A being present in an amount of from 0.4 to 1.5% by weight, component B in an amount of from 0.5 to 2.5% by weight, and component C in an amount of from 0.5 to 1.5% by weight, each relative to the total composition.

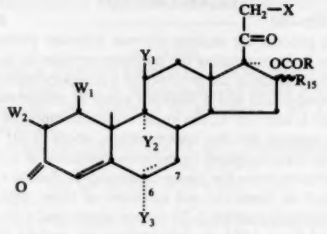
4,113,680

METHOD FOR PREPARING 17 α-ESTER-21-HALO PREGNANES

Yoshiaki Kamano, Tokyo; Kazuhiko Michishita, Saitama; Teruya Seki, and Ichiro Tanaka, both of Tokyo, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1976, Ser. No. 671,693
Claims priority, application Japan, Mar. 31, 1975, 50-38914; May 1, 1975, 50-52085
Int. Cl.² C07J 5/00
U.S. Cl. 260—397.45 **15 Claims**

1. A method for preparing a 17α-ester-21-halo pregnane of the formula



wherein R is selected from the group consisting of alkyl containing 1 to 9 carbon atoms, cycloalkyl containing 4 to 6 carbon atoms, phenyl, lower alkylphenyl, nitrophenyl and halophenyl,

X is halogen,

Y_1 is halogen, hydroxy or oxo, Y_2 is hydrogen or halogen, or Y_1 and Y_2, together with their adjacent carbon atoms, form an epoxy ring or a double bond,

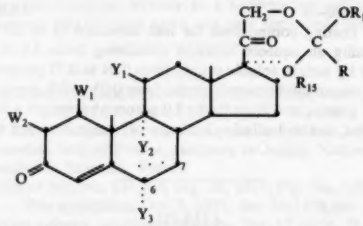
Y_3 is halogen, hydrogen or methyl,

W_1 is hydrogen or methyl, W_2 is hydrogen or methyl, or W_1 and W_2, together with their adjacent carbon atoms, form a cyclopropane ring or a double bond,

R_{15} is hydrogen, methyl, methylene, hydroxy, lower alkoxy or acyloxy containing 2 to 8 carbon atoms,

the wavy line represents the α- or β- configuration, and the bond between the carbon atoms at the 6 and 7 positions is a single or double bond,

which comprises reacting a 17α,21-cyclic orthoester of a 17α,21-dihydroxy pregnane of the formula



wherein Rhd 1 is lower alkyl and R, Y_1, Y_2, Y_3, W_1, W_2, R_{15}, the wavy line and the bond between the carbon atoms at the 6 and 7 positions are as defined above,

with a halo compound selected from the group consisting of silyl halides, acyl halides, phosphorus oxyhalides, sulfonyl halides, N-haloimides, N-haloamides and phosphorus pentahalides, in the presence of an organic polar solvent selected from the group consisting of dimethylformamide, N-methylpyrrolidone, hexamethylphosphoric triamide and dimethylsulfoxide, or a mixture of said organic polar solvent and an organic non-polar solvent, which mixture of solvents contains at least 50% by weight of the organic polar solvent.

4,113,681

THERMOPLASTIC POLYVINYL CHLORIDE-ACRYLIC POWDER COATING COMPOSITION

Charles Moore Harmuth, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 10, 1977, Ser. No. 795,565
Int. Cl.[2] C08L 91/00, 63/00
U.S. Cl. 260—28.5 D 10 Claims

1. A thermoplastic powder coating composition of powder particles having a particle size of about 1–100 microns; wherein the powder particles consist essentially of a binder of a blend of:

(A) about 45–85% by weight of a polyvinyl chloride terpolymer consisting essentially of
(1) 72–87% by weight, based on the weight of the terpolymer, of vinyl chloride,
(2) 10–25% by weight, based on the weight of the terpolymer, of vinyl acetate and
(3) 0.1–3% by weight, based on the weight of the terpolymer, of maleic acid; wherein the terpolymer has a weight average molecular weight of about 20,000–125,000 determined by gel permeation chromatography using polystyrene as a standard;

(B) about 5–40% by weight of an acrylic polymer consisting essentially of 40–95% by weight of a methyl methacrylate, 4.7–55% by weight of an alkyl acrylate or an alkyl methacrylate having 2–12 carbon atoms in the alkyl group and 0.3–5% by weight of an α-β ethylenically unsaturated carboxylic acid and having a weight average molecular weight of about 10,000–100,000 determined as above; and

(C) about 10–25% by weight of a plasticizer of triisodecyl trimellitate

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4,113,682

COATING COMPOSITION CONTAINING RESIN HAVING TERTIARY ALIPHATIC GROUP AND REACTIVE HYDROXYL GROUP, PROCESS FOR ITS PREPARATION AND ARTICLE COATED WITH THE COMPOSITION

Nobuyoshi Nagata, Nara, and Ryuzo Mizuguchi, Osaka, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 439,797, Feb. 5, 1974, abandoned, which is a continuation of Ser. No. 163,492, Jul. 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 732,526, May 28, 1968, abandoned. This application Jun. 23, 1976, Ser. No. 699,025
Claims priority, application Japan, Jun. 2, 1967, 42-34872
Int. Cl.[2] C08L 61/28, 61/24
U.S. Cl. 260—29.4 UA 28 Claims

1. A process for preparing a coating composition containing water, a water-soluble, organic solvent and a water-soluble thermosetting resin, which comprises preparing a mixture of

(1) 5 to 30 parts by weight of an α,β-ethylenically unsaturated carboxylic acid having 3 to 5 carbon atoms or a monoester thereof with an alkanol having 1 to 4 carbon atoms,

(2) 5 to 50 parts by weight of an addition product of a polymerizable α,β-ethylenically unsaturated carboxylic acid having 3 to 5 carbon atoms with a glycidyl ester of a tertiary aliphatic monocarboxylic acid, or an addition product of a monoglycidyl ester of a polymerizable, α,β-ethylenically unsaturated carboxylic acid having 3 to 5 carbon atoms with a tertiary aliphatic monocarboxylic acid, wherein said tertiary aliphatic group contains 4 to 25 carbon atoms,

(3) 40 to 90 parts by weight of a hydroxy-free polymerizable unsaturated monomer having 2 to 30 carbon atoms, and

(4) up to 20 parts by weight of a polymerizable unsaturated monomer having a hydroxyl group and 3 to 8 carbon atoms,

heating the resulting mixture in the presence of a polymerization initiator to form a copolymer, adding to the resulting copolymer 0.5 to 2.0 equivalents of an amine with respect to the carboxyl group in said copolymer to form a water-soluble salt, and then mixing the resulting salt with 4 to 50 parts by weight of a water-soluble amino resin, based on 100 parts by weight of said copolymer.

4,113,683

PRODUCTION OF HIGH TEMPERATURE RESISTANT POLYMER COMPOSITIONS CAPABLE OF FORMING SUPERIOR FIBER REINFORCED COMPOSITE ARTICLES

Ilmar L. Kalnin, Millington, and George J. Breckenridge, Clark, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,927
Int. Cl.[2] C08G 41/02, 51/16, 69/48, 73/18
U.S. Cl. 260—857 TW 30 Claims

1. A process for providing a high temperature resistant composition from a normally intractable high temperature resistant polymer, which composition is capable of forming a three dimensional shaped article which comprises:

I. providing a solution of a substance selected from the group consisting of:
(a) a nitrogenous intractable high temperature resistant polymer which does not have a glass transition temperature below its decomposition temperature, or precursors capable of forming the same; and
(b) an admixture comprising from about 60 to about 95 parts by weight of the intractable polymer of (a) and from about 5 to about 40 parts by weight of at least one cross-linkable polymer exhibiting a glass transition temperature above 200° C and below its decomposition temperature, or precursors capable of forming the same;

II. providing a suspension of partially plasticized organic fibers derived from polymers selected from the group consisting of:
(a) the intractable polymer of step I(a),
(b) polybenzimidazoles,
(c) high temperature resistant aromatic polyamides,
(d) high temperature resistant aromatic polyesters, and
mixtures thereof;

III. combining the suspension of II and the solution of I in a manner sufficient to provide a precipitation of a major portion of the dissolved substance of I affixed to the suspended organic fibers of II thereby forming a mixture containing a fiber-particle aggregate;

IV. combining the mixture of III with a non-solvent in a manner sufficient, and with properties sufficient to precipitate, affix, and incorporate the remaining portion of the dissolved substance of I from the mixture of III into the fiber-particle aggregate to form a fiber-particle aggregate composition comprising from about 95 to about 50%, by composition weight, of the substance present in the solution of I affixed to and intimately admixed with from about 5 to about 50%, by composition weight, of said organic fibers of II; and

V. filtering and washing the composition to remove residual solvent.

4,113,684

LOW TEMPERATURE CURE EPOXY-AMINE ADHESIVE COMPOSITIONS

Edward M. Petrie, Wilkinsburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

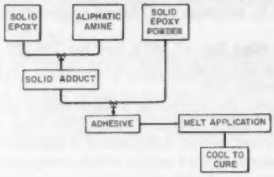
Filed Dec. 10, 1976, Ser. No. 749,592
Int. Cl.[2] C08L 63/00
U.S. Cl. 260—29.2 EP 7 Claims

1. A composition admixture which consists of:

(A) a particulated solid reaction product adduct consisting of:
(i) 1 part by weight of a solid epoxy resin selected from the group consisting of diglycidyl ethers of bisphenol A epoxy resins, diglycidyl ethers of bisphenol F epoxy resins, and mixtures thereof, and

(ii) about 0.20 part by weight of about 1.5 parts by weight of an aliphatic polyamine, to provide a stoichiometric excess of amine, and

(B) about 1 part by weight to about 6 parts by weight, for each 1 part of adduct, of a reactive solid epoxy resin powder having an average particle size range of from about 10 microns to about 420 microns, selected from the group consisting of diglycidyl ethers of bisphenol A epoxy resin, diglycidyl ethers of bisphenol F epoxy resins



and mixtures thereof, having a melting point of between about 55° C. to about 225° C.; wherein the composition is a solid two phase reactive mass comprising a uniform solid dispersion of adduct (A) and epoxy powder (B), wherein the melting point of the adduct is within about 1° C. to about 50° C. of the melting point of the epoxy powder; said composition being capable of melting at temperatures of over about 60° C., and forming a cross linked adhesive material on cooling after melting.

4,113,685

FLOCCULATING AGENT COMPRISING WATER-IN-OIL EMULSION OF STABILIZER PLUS NH-ACTIVE POLYMER CARRYING FORMALDEHYDE AND AMINE RADICALS

Wolfgang Hubner, Kempen; Eduard Barthell, Krefeld, and Kurt Dahmen, Mönchen-Gladbach, all of Germany, assignors to Chemische Fabrik Stockhausen & Cie, Krefeld, Germany

Continuation-in-part of Ser. No. 538,428, Jan. 2, 1975, which is a continuation-in-part of Ser. No. 485,474, Jul. 3, 1974, abandoned. This application May 3, 1976, Ser. No. 682,543

Claims priority, application Fed. Rep. of Germany, May 6, 1975, 2520028

Int. Cl.[2] C08L *61/20*

U.S. Cl. 260—29.4 UA **11 Claims**

1. In a flocculation, sedimentation, dehydration or retention composition comprising a stable dispersion of about 10 to 50% concentration by weight of a water-soluble polymeric Mannich base in a mixture of water, a water-insoluble liquid and a quantity of an emulsifier of a suitable HLB number effective to produce a stable water-in-oil emulsion, the Mannich base comprising an H- active polymer carrying carbonamide groups reacted with formaldehyde and a primary or secondary alkyl- or hydroxylalkylamine wherein the alkyl groups have up to about 18 carbon atoms, said formaldehyde and said amine being employed in the reaction in approximately equimolar amounts, and said formaldehyde being present in at least about 0.1 times the molar amount of the carbonamide groups, the improvement which comprises including in said emulsion a stabilizing member selected from the group consisting of

(a) a water-soluble salt of an amine,

(b)(a) in admixture with an amine,

(c)(a) in admixture with ammonia,

(d) an ammonium salt of a mineral acid plus ammonia, and

(e) a carboxylic acid amide,

whereby said emulsion is stable even after storage for prolonged periods of time.

4,113,686

HYDROPHILIC CONTACT LENSES AND LENS POLYMER

Frank O. Holcombe, Jr., Beltsville, Md., assignor to Burton, Parsons and Company, Inc., Washington, D.C.

Filed Jun. 9, 1977, Ser. No. 805,146

Int. Cl.[2] C08F *4/36, 120/06, 20/06;* C08L *33/02*

U.S. Cl. 260—29.6 TA **3 Claims**

1. A hydrophilic gel polymer consisting of the addition copolymer of about the following in parts of volume:

2-hydroxethyl methacrylate — 100 parts

isobutyl methacrylate — 10 parts

trimethylolpropane trimethyacrylate — 0.136 parts

methacrylic acid — 1.35 parts

2,5 dimethyl 2,5 bis(2-ethyl hexoyl peroxy) hexane — 0.25 parts.

4,113,687

PROCESS FOR PREPARING LATEX

John Ugelstad, Trondheim, Norway, assignor to Sintef, Norway

Filed Aug. 16, 1977, Ser. No. 825,136

Claims priority, application Norway, Aug. 10, 1977, 772805

Int. Cl.[2] C08F *2/24*

U.S. Cl. 260—29.6 XA **21 Claims**

1. A process for preparing a latex which comprises homogenizing under pressure an aqueous mixture containing an emulsifier and a water-insoluble solvent for the vinylic monomer(s) to be polymerized, said solvent having a water-solubility at 25° C. of $<10^{-3}$ g/l H_2O to form a stable preemulsion of said solvent in water, whereby the increased pressure of homogenization resulting in smaller but more drops in said preemulsion and consequently in the final latex, and then adding to said preemulsion the monomer(s) to be polymerized and optionally additional water, together with or followed by a polymerization initiator selected from water-soluble polymerization initiators and oil-soluble polymerization initiators having sufficient water solubility to diffuse through the aqueous phase into the drops formed by diffusion of the monomer(s) into said solvent, the weight ratio of emulsifier and solvent to total water being 1:500–1:50 and 1:1000–3:100, respectively, and the weight ratio of emulsifier and solvent to monomer(s) being 1:500–1:30 and 1:1000–1:20, respectively.

4,113,688

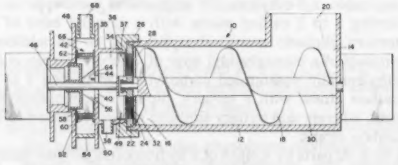
PROCESS FOR RAPIDLY DISSOLVING GELS OF WATER-SOLUBLE POLYMERS BY EXTRUSION, CUTTING AND THEN SLURRYING UNDER HIGH SHEARING FORCES

Stephen C. Pearson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 14, 1977, Ser. No. 860,423

Int. Cl.[2] C08L *33/02*

U.S. Cl. 260—29.6 PM **6 Claims**



1. A process for preparing dilute aqueous solutions of water-soluble polymer having an intrinsic viscosity of at least one deciliter per gram measured in 2 normal sodium chloride 25.5 C. from gels of said polymer, said process comprising the steps of:

(a) extruding the water-soluble polymer gels into flowing water through die holes in an extrusion die plate, said die

holes having diameters of from at least about 0.06 inch to about 0.50 inch, forming polymer gel strands,

(b) cutting the extruding polymer gel strands at the exterior surface of the extrusion die plate to a length of less than about 0.75 inch, forming a slurry of the cut gel particles in the flowing water,

(c) subjecting the slurry of gel particles of step (b) to high shearing forces immediately after formation of said slurry such that no substantial dissolution of the gel particles occurs prior to subjecting of said particles to said high shearing forces, said forces being sufficient to reduce the particle size of the cut gel particles to less than about 0.030 inch in greatest dimension, and

(d) mixing the resultant slurry of fine gel particles and additional water under low shear conditions sufficient to maintain the suspension of particles in water, rapidly forming a dilute aqueous solution of polymer.

4,113,689

HALOGENATED ESTERS OF POLYCARBOXYLIC ACIDS AND PLASTICIZERS FOR CHLORO-VINYL POLYMERS BASED ON SAID ESTERS

Mario Modena, Bollate (Milan); Pietro Massardo, and Lucio Castelnuovo, both of Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 463,363, Apr. 23, 1974, abandoned. This application Jun. 9, 1976, Ser. No. 695,748

Claims priority, application Italy, Apr. 24, 1973, 23364 A/73

Int. Cl.[2] C08K *5/10*

U.S. Cl. 260—31.8 HA 7 Claims

1. Plasticized compositions comprising polymers of chlorinated monomers selected from the group consisting of chlorovinyl and chlorovinylidene polymers and, per 100 parts by weight of said polymers, from 1 to 150 parts by weight of a halogenated ester of a carboxylic acid having the general formula

$$A\text{—}CH_2\text{-}CH=CX_2]_2 \qquad I$$

in which X is halogen and A is a bivalent radical of formula

$$\text{-OOC-R-COO-} \qquad II$$

in which R is an aromatic hydrocarbon group.

4,113,690

SILICONE ELASTOMERS CONTAINING ALKOXYSILOXANOLS

Richard Newton Lewis, Tecumseh, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Continuation-in-part of Ser. No. 645,734, Dec. 31, 1975, abandoned, Division of Ser. No. 435,151, Jan. 24, 1975, Pat. No. 3,979,546, which is a division of Ser. No. 214,406, Dec. 30, 1971, Pat. No. 3,799,962. This application Feb. 16, 1977, Ser. No. 769,062

Int. Cl.[2] C08L *00/00*

U.S. Cl. 260—37 SB 8 Claims

1. An improved composition containing a silicone gum and a reinforcing filler, the improvement which comprises incorporating in said composition from 1 to 30 percent by weight based on the weight of the silicone gum of an alpha-alkoxy-omega-siloxanol of the formula $R'O(R_2SiO)_xH$, in which R is selected from the class consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and cyanoalkyl radicals having from 1 to 8 carbon atoms, R′ is an alkyl radical having up to 4 carbon atoms, and x is an integer of from 2 to 10.

4,113,691

POLYMERIC ORGANOSILICON COMPOUNDS

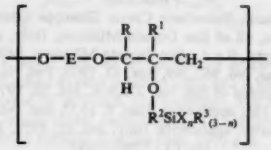
Robert James Ward, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 2, 1977, Ser. No. 773,776

Int. Cl.[2] C08L *63/02*

U.S. Cl. 260—37 EP 12 Claims

1. A polymeric organosilicon compound characterized by the repeating unit



wherein R and R^1 are each, individually, hydrogen or methyl; E is the residue obtained by removing the hydroxyl groups from a dihydric polynuclear phenol in which the hydroxyl groups are attached to different nuclei; R^2 is a divalent organic radical; R^3 is hydrogen or alkyl of up to 4 carbon atoms; n is an integer having a value of from 1 to 3; and X is a hydrolyzable groupm, said compound having a weight average molecular weight of from 1,000 to 100,000 and containing from 0.5 to 5.5 weight per cent silicon.

4,113,692

REINFORCED THERMOPLASTIC COMPOSITIONS OF POLYESTER RESINS AND A POLYCARBONATE RESIN

Allen Dale Wambach, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 6, 1976, Ser. No. 747,635

Int. Cl.[2] C08K *7/14*

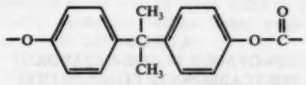
U.S. Cl. 260—40 R 7 Claims

1. A thermoplastic molding composition which, after molding, possesses increased resistance to warpage, the composition comprising, in intimate admixture:

(a) a poly(1,4-butylene terephthalate) resin;

(b) a poly(ethylene terephthalate) resin;

(c) a polycarbonate resin having repeating units of the formula



and

(d) a reinforcing agent comprising glass fibers in an amount at least sufficient to provide reinforcement.

4,113,693

PROCESS FOR THE PRODUCTION OF ACRYLIC COMPOUNDS AND RESINOUS PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 703,925, Jul. 9, 1976, Pat. No. 4,011,253. This application Jun. 9, 1977, Ser. No. 804,897

Int. Cl.[2] C08G *77/04*

U.S. Cl. 528—271 18 Claims

1. The process for the production of acrylic compounds and resinous products by the following steps:

(a) mixing about 2 parts by weight of a fine granular silica with an acrylic compound in water;

(b) adding 0.5 to 1.5 parts by weight of an alkali catalyst;

(c) adding a catalytic amount of a peroxide initiator;

(d) heating the said mixture to 80° to 100° C. while agitating for 10 to 30 minutes at ambient pressure, thereby

(e) producing an emulsion of an acrylic silicate resinous product.

4,113,694

PROCESS FOR PRODUCING STABILIZED OLEFIN TERPOLYMERS AND STABILIZED OLEFIN TERPOLYMERS PRODUCED ACCORDING TO SAID PROCESS

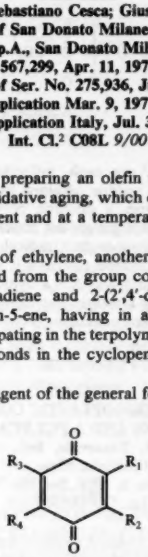
Sergio Arrighetti; Sebastiano Cesca; Giuseppe Ghetti, and Eugenio Vajna, all of San Donato Milanese, Italy, assignors to Snam Progetti, S.p.A., San Donato Milanese, Milan, Italy

Division of Ser. No. 567,299, Apr. 11, 1975, Pat. No. 4,055,535, which is a division of Ser. No. 275,936, Jul. 28, 1972, Pat. No. 3,892,712. This application Mar. 9, 1977, Ser. No. 775,776
Claims priority, application Italy, Jul. 31, 1971, 27014 A/71
Int. Cl.[2] C08L 5/00
U.S. Cl. 260—875 9 Claims

1. A process for preparing an olefin terpolymer which is stabilized against oxidative aging, which comprises reacting in a hydrocarbon solvent and at a temperature between 0° and 150° C:

(a) a terpolymer of ethylene, another alpha olefin, and a polyene selected from the group consisting of dehydro-iso-dicyclopentadiene and 2-(2',4'-dimethyl-penta 1',3'-dienyl-)-norborn-5-ene, having in addition to a double bond for participating in the terpolymer formation, conjugated double bonds in the cyclopentadienyl substituent, with

(b) a dienophilic agent of the general formula:



wherein R_1, R_2, R_3, and R_4 may be hydrogen or alkyl, aryl, cycloalkyl or aralkyl radicals having up to 8 carbon atoms, moreover the R_1–R_2 and R_3–R_4 pairs may be divalent radicals forming condensed rings.

4,113,695

NON-OPAQUE FLAME-RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 15, 1976, Ser. No. 733,015
Int. Cl.[2] C08K 5/34
U.S. Cl. 260—45.8 N 14 Claims

1. An improved non-opaque flame-retardant polycarbonate composition of an aromatic carbonate polymer in admixture with 0.001 to about 2.0 parts per hundred parts of the aromatic carbonate polymer of an additive selected from the group consisting of organic alkali metal salts of aromatic sulfonic acids, organic alkaline earth metal salts of aromatic sulfonic acids or mixtures thereof, the improvement which comprises having in admixture with the flame-retardant aromatic carbonate polymer 0.001 to about 2.0 parts per hundred parts of the aromatic carbonate polymer an inorganic halide selected from the group consisting of an alkali metal halide, an alkaline earth metal halide or mixtures thereof, the halogen substituent in said inorganic halide being bromine, chlorine or iodine and said aromatic carbonate polymer, said organic metal salts or mixtures thereof, and said inorganic halide each having a refractive index in the range of 1.54 to 1.65.

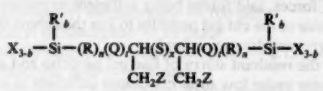
4,113,696

POLYSULFIDE SILICON COMPOUNDS

Thomas Charles Williams, Ridgefield, Conn., and George Edward Totten, Hartsdale, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 28, 1977, Ser. No. 810,785
Int. Cl.[2] C08G 77/04
U.S. Cl. 260—448.2 B 15 Claims

1. A polysulfide silicon composition of matter selected from the class consisting of polysulfide silanes having the formula



(I)

wherein

R' is hydrogen or a monovalent radical selected from the class consisting of hydrocarbon radicals and substituted hydrocarbon radicals;

wherein X is a hydrolyzable radical selected from the class consisting of alkoxy, aryloxy, acyloxy, secondary amino and aminooxy radicals;

wherein R is a divalent bridging group selected from the class consisting of hydrocarbon radicals, groups of the formula —R"OR"— and groups of the formula —R"SR"— wherein R" is a divalent hydrocarbon radical;

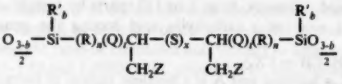
wherein Q is an oxygen atom or a sulfur atom;

wherein Z is a monovalent organic amino radical the nitrogen atom of which is directly bonded to the carbon atom of the (CH_2) group of the above formula;

wherein n has a value of 0 or 1 and t has a value of 0 or 1, with the proviso that when n is 0, then t is 0; and

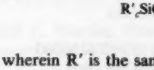
wherein b has a value of 0 to 2, and x has a value of 2 to 4;

(ii) polysulfide siloxane homopolymers consisting essentially of siloxy units having the formula



(II)

wherein R', R, Q, Z, n, t, b and x are the same as defined above; and (iii) polysulfide siloxane copolymers consisting essentially of at least one siloxy unit represented by formula (II) above and at least one siloxy unit represented by the formula



(III)

wherein R' is the same as defined in formula (II) above, and wherein c has a value of from 0 to 3 inclusive.

4,113,697

POLYETHER DIAMIDE EPOXY ADDITIVES

Heinz Schulze, and Harold G. Waddill, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

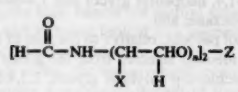
Filed Nov. 22, 1976, Ser. No. 743,818
Int. Cl.[2] C08G 59/46
U.S. Cl. 528—94 14 Claims

1. An epoxy resin composition having superior resistance to thermal shock and being the cured product of a curable admixture which comprises:

a vicinal polyepoxide having an epoxide equivalency of greater than 1.8;

a curing amount of an alkyl substituted dicarboxylic bicyclic vicinal anhydride curing agent; and,

an effective amount of an additive consisting essentially of a polyether diamide having the formula



wherein X is hydrogen, a methyl radical or an ethyl radical; Z is a hydrocarbon alkylene radical having 2 to 5 carbon atoms and *n* is a number selected such that the molecule of the above formula has a molecular weight of from about 2000 to about 3000.

4,113,698

AROMATIC POLYMER PRODUCTION

Philip Anthony Staniland, Tewin Wood, England, assignor to Imperial Chemical Industries Limited, London, England

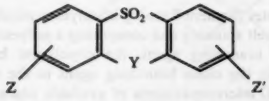
Filed Feb. 10, 1977, Ser. No. 767,333

Claims priority, application United Kingdom, Feb. 10, 1976, 5172/76

Int. Cl.[2] **C08G** *65/40, 75/20*

U.S. Cl. 528—481 **11 Claims**

1. A process for the separation of an aromatic etherketone polymer or etherketone/sulphone copolymer containing phenylene groups linked by oxygen atoms and by ketone groups, not more than 25% of the combined total of ketone and sulphone groups being sulphone groups, from the reaction product resulting from the nucleophilic polycondensation of at least one member of the group consisting of i) a mixture of 49–50% molar of at least one alkali metal bisphenate and correspondingly 51–50% molar of at least one dihalo compound, and ii) at least one alkali metal halophenate, in an aromatic sulphone solvent of formula



in which Y is a direct link, oxygen or a pair of hydrogen atoms, one attached to each benzene ring, and Z and Z', which may be the same or different, are hydrogen atoms or phenyl groups, comprising cooling the reaction product from the polymerisation temperature until the reaction product has solidified, finely dividing the reaction product, leaching out the alkali metal halide with water and then heating the resultant finely divided material to a temperature of at least 200° C, but below the melting point of the material, under reduced pressure to distil off any remaining water and the aromatic sulphone solvent.

4,113,699

PRODUCTION OF AROMATIC POLYMERS

John Brewster Rose, Letchworth, and Philip Anthony Staniland, Tewin Wood, both of England, assignors to Imperial Chemical Industries Limited, London, England

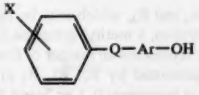
Filed Jun. 24, 1977, Ser. No. 810,355

Claims priority, application United Kingdom, Jul. 8, 1976, 28432/76; Feb. 1, 1977, 4013/77

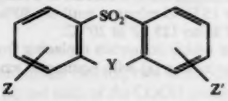
Int. Cl.[2] **C08G** *65/38, 75/23*

U.S. Cl. 528—126 **9 Claims**

1. A process for the manufacture of aromatic polyethersulphones and ketones and copolymers thereof comprising heating at 200 to 400° C at least one halophenol of the formula



where X is halogen and is ortho or para to Q, Q is —CO— or —SO_2—, and Ar is a divalent aromatic radical, with about 0.5 moles of alkali metal carbonate, or about 1 mole of an alkali metal bicarbonate, per mole of halophenol, in the presence of a solvent selected from N-methyl pyrrolidone, dimethyl sulphone and an aromatic sulphone of formula



where Y is a direct link, an oxygen atom or two hydrogen atoms (one attached to each benzene ring) and Z and Z', which may be the same or different, are hydrogen atoms or phenyl groups, said alkali metal carbonate or bicarbonate being in granular form of particle size less than 1000 μm.

4,113,700

PROCESS FOR PREPARING HIGH ORTHO NOVOLAC RESINS

Harry M. Culbertson, Belchertown, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 10, 1977, Ser. No. 758,370

Int. Cl.[2] **C08G** *8/10*

U.S. Cl. 528—138 **8 Claims**

1. In a process for the production of phenol-aldehyde novolac resins of the class which is characterized by having a preponderance of ortho/ortho methylene bridges and which is prepared by an acid aqueous reaction mixture containing a material selected from the group consisting of phenol and metaalkylphenols in molar excess with a source of formaldehyde, conducting said reacting in the presence of a catalyst comprising:

(A) a divalent electropositive metal compound selected from the group consisting of oxides, hydroxides and organic acid salts selected from the group consisting of formates, lactates, acetates and benzoates or mixtures thereof wherein the improvement comprises conducting said reacting with said catalyst in combination with

(B) a divalent electropositive metal salt selected from the group consisting of sulfonates and fluoroborates or

(C) acids selected from the group consisting of sulfonic and fluoroboric and mixtures thereof, said reacting being carried out under aqueous reflux conditions, with a phenol to formaldehyde molar ratio of about 1.20:1 to 2.0:1, said ortho/ortho methylene bridges being present in an amount of 75 to 100%.

4,113,701

METHOD FOR THE PREPARATION OF HARDENABLE UREA FORMALDEHYDE RESINS

Arnold Laqua, and Ulrich Holtschmidt, both of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed May 3, 1977, Ser. No. 793,315

Claims priority, application Fed. Rep. of Germany, May 8, 1976, 2620478

Int. Cl.[2] **C08G** *14/08, 14/10;* **G08G** *12/12*

U.S. Cl. 260—29.4 R **1 Claim**

1. In a process for the preparation of solutions of hardenable urea-formaldehyde resins suitable for impregnating and coating paper supports for coating the surface of wood-based panels wherein

(a) an aqueous solution of urea and formaldehyde in a mole ratio of 1 : 1 to 2.5 are reacted for 10 to 30 minutes at 70° to 95° C in the presence of 0.2 to 1.0 mmoles of an aminosulfonic acid and 20 to 100 mmoles of ammonia, each based on 1 mole of urea, until the 50% solution has a viscosity of 55 to 65 cP at 20° C;

(b) 0.8 to 10 mmoles of an aminosulfonic acid are then added,

and a pH of 4.0 to 4.5 is maintained by ammonia addition during a reaction time of 10 to 25 minutes at 70° to 95° C, until the 50% solution has a viscosity of 80 to 110 cP at 20° C, and then;

(c) the reaction product from step (b) is treated with 40 to 200 mmoles of ammonia as well as 0.1 to 0.3 moles of urea and the reaction mixture is reacted at a temperature of 70° to 95° C for 15 to 45 minutes, until the 50% solution has a viscosity of 85 to 125 cP at 20° C.

the improvement which comprises replacing from 0.01 to 0.05 moles of the urea in step (a) with equimolar amounts of melamine.

4,113,702

METHOD OF PREPARING POLYESTER VARNISH RESINS OF LOW VISCOSITY

Erich Psencik, Witten-Bommern, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jul. 22, 1975, Ser. No. 598,084

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1974, 2436371

Int. Cl.² C08G *63/76*

U.S. Cl. 528—75 **18 Claims**

1. A process for preparing a varnish resin having a viscosity of 1,000 to 4,000 cP, an acid number from 0 to 1 and a hydroxyl number between 100 and 250 which comprises:

A. condensing at 50° to 260° C a polycarboxylic acid or anhydride with an alcohol until a resin is formed having an acid number between 10 and 80 a hydroxyl number of 120–250 and a viscosity between 30,000 and 180,000 cP; and

B. thereafter adjusting the temperature thereof to 80°–100° C and adding to the resultant resin a glycidyl ester of a saturated aliphatic carboxylic acid having 10 to 30 carbon atoms in an amount of 30 to 70% by weight based upon the weight of the resin obtained in step A and condensing the glycidyl ester with the resin from step A at a temperature of 110 to 150° C until the acid number of the resin in between 0 and 1 and the resin has a viscosity of 1000 to 4000 cP.

4,113,703

UNSATURATED POLYESTERS DERIVED FROM CHLOROXYLYLENE DIOLS

Georg Blumenfeld, St. Augustin, and Norbert Vollkommer, Troisdorf, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation of Ser. No. 488,601, Jul. 12, 1974, abandoned. This application Dec. 12, 1975, Ser. No. 640,312

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1973, 2336704

Int. Cl.² C08G *63/54, 63/68*

U.S. Cl. 528—299 **13 Claims**

1. An unsaturated polyester soluble in styrene in an amount of 20 to 80% by weight and soluble in methylacrylate, methyl methacrylate, acrylonitrile, divinylbenzene and diallylphthalate and capable of being formed into a colorless transparent plate, said unsaturated polyester prepared by the condensation polymerization of a mixture of monomers, said mixture consisting essentially of:

A. A member selected from the group consisting of fumaric acid, maleic acid, maleic acid anhydride, an alkali salt of maleic acid and an alkali salt of fumaric acid;

B. A member selected from the group consisting of hexachlorenedomethylene tetrahydrophthalic acid, hexachlorophthalic acid, tetrahydrophthalic acid, adipic acid, their alkali salts or anhydrides, orthophthalic acid, its alkali salt, anhydride or lower alkyl ester, isophthalic acid, its alkali salt, anhydride or lower alkyl ester and terephthalic acid, its alkali salt, anhydride or lower alkyl ester;

C. An alcohol selected from the group consisting of ethylene glycol, diethylene glycol, propanediol-1,2, butanediol-1,3, butanediol-1,4, neopentyl glycol and 1,4-bis-(hydroxymethyl)-cyclohexane; and

D. 1 to 100 mol percent, relative to the sum of the C components, of a member selected from the group consisting of 2,3,5,6-tetrachloro-p-xylylene glycol, 2,3,4,6-tetrachloro-m-xylylene glycol, 2,3,5,6-tetrachloro-p-xylylene glycol-bis-(2,2-dimethyl-γ-hydroxypropyl ether), 2, 3, 5, 6-tetrachloro-p-xylylene dichloride and 2,3,4,6-tetrachloro-m-xylylene dichloride.

4,113,704

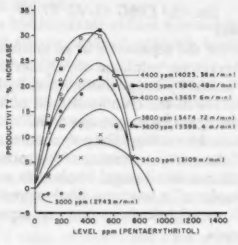
POLYESTER FILAMENT-FORMING POLYMER AND ITS METHOD OF PRODUCTION

Donald L. MacLean, Raleigh, and Robert T. Estes, Cary, both of N.C., assignors to Monsanto Company, Decatur, Ala.

Filed Jun. 24, 1976, Ser. No. 699,543

Int. Cl.² C08G *63/12*

U.S. Cl. 528—289 **20 Claims**


PRODUCTIVITY % INCREASE
LEVEL ppm (PENTAERYTHRITOL)
4400 ppm (4023. 36 m/min)
4200 ppm (3840. 48m/min)
4000 ppm (3657 6m/min)
3800 ppm (3474. 72 m/min)
3600 ppm (3288. 4 m/min)
3400 ppm (3109 m/min)
3000 ppm (2743 m/min)

1. A polyester filament-forming copolymer suitable for high throughput melt spinning and comprising a polyester polymer and a chain branching agent, the copolymer being chain branched with the chain branching agent to the extent provided by 1–10 microequivalents of available chain branching reactive sites based on one gram of the copolymer.

4,113,705

TRIISOCYANATES USEFUL FOR THE PRODUCTION OF POLYURETHANE RESINS

Manfred Bock, Leverkusen; Josef Pedain, Cologne, and Walter Uerdingen, Bergisch-Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

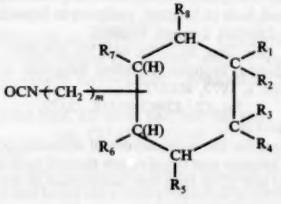
Filed Mar. 17, 1977, Ser. No. 778,631

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614243

Int. Cl.² C07C *119/045;* C08G *18/75*

U.S. Cl. 260—859 R **7 Claims**

1. Triisocyanates of the formula



in which R_1, R_2, R_3 and R_4, which may be the same or different, represent hydrogen, a methyl group or the group—$(CH_2)_n$—NCO where n represents an integer of from 1 to 3 and two of the groups represented by R_1, R_2, R_3 or R_4 are —$(CH_2)_n$—NCO groups; m represents 0, 1 or 2; and R_5, R_6, R_7 and R_8, which may be the same or different, represent hydrogen or a

methyl group, the total number of methyl groups represented by R_5, R_6, R_7 and R_8 being limited to a maximum of 2.

3. In an isocyanate polyaddition process for the production of polyurethane resins, the improvement comprising reacting compounds having a molecular weight of from about 400 to 10,000 which contain at least two hydrogen atoms capable of reacting with isocyanate groups and the triisocyanates of claim 1.

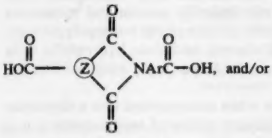
4,113,706
AROMATIC IMINO ACIDS AND RESINS DERIVED THEREFROM

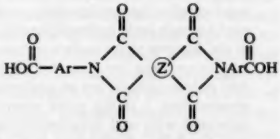
Daniel J. Lange, St. Louis, Mo., assignor to The P. D. George Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 676,550, Apr. 12, 1976, Pat. No. 4,069,209. This application Aug. 11, 1977, Ser. No. 823,732
Int. Cl.[2] C08G 63/68, 69/44
U.S. Cl. 528—289 **11 Claims**

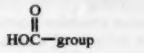
1. A resin derived from

(A) a dicarboxylic acid component which is an imino-dicarboxylic acid of the formula

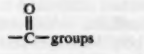




where Ⓩ and Ⓩ are aromatic moieties, the indicated



attached to Ⓩ being attached to an aromatic ring of Ⓩ the



linking an N to Z or Z' each being attached to an aromatic ring in Ⓩ or Ⓩ and being present in a 5 membered imide ring and the moiety Ar being an aromatic ring, the N and COOH moieties being attached to the aromatic ring; and of a polyhydric alcohol component which is at least one of

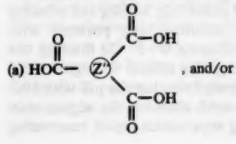
(B) a glycol component, and

(C) a polyol component containing at least three esterifiable hydroxyl groups; and any further components of said resin being

(D) the imide or imide-amide of

(D_1) an aromatic diamine and

(D_2) an aromatic tricarboxylic or aromatic tetracarboxylic acid, of the formulae, respectively,



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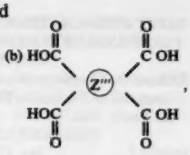


or the anhydrides thereof, two of the COOH groups of the acid (a) and each of the COOH groups of each of the two pairs of such groups of the acid (b) being attached to adjacent carbons of a benzene ring of the Ⓩ and Ⓩ moieties, respectively, Ⓩ and Ⓩ being aromatic moieties;

where (A) and at least one of (B) and (C) and (D) are the sole polymer-forming components of said resin and only the components (A) and at least one of (B) and (C) are required to be present as polymer forming components.

4,113,707
POLY(OXYALKYLENE)-POLYESTER-POLY(SULFIDE)-POLYTHIOL PREPARED BY ESTER INTERCHANGE

Rector P. Louthan, and Richard C. Doss, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 720,474, Sep. 3, 1976, abandoned. This application Nov. 2, 1976, Ser. No. 737,948
Int. Cl.[2] C08G 63/68
U.S. Cl. 528—279 **26 Claims**

1. A method of preparing a poly(oxyalkylene)-polyester-poly(sulfide)-polythiol having on the average more than two pendant thiol groups comprising reacting in the presence of a transesterification catalyst a mixture of

(a) an alkyl mercaptocarboxylate of the formula

$$HS-CR_2-_nCOOR'$$

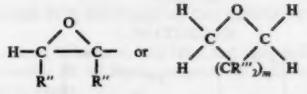
wherein R' is an alkyl radical containing from 1 to 5 carbon atoms, wherein R is hydrogen or R', wherein n is an integer having a value of from 1 to 5 and wherein the total number of carbon atoms in all R groups is up to 15 carbon atoms per molecule; and

(b) at least one dialkyl thiodicarboxylate of the formula

$$R'OOC-CR_2-_nS_r-CR_2-_nCOOR'$$

wherein r is an integer of from 1 to 5, R, R', and n are as defined in (a) and wherein said dialkyl thiodicarboxylate contains a total of no more than 30 carbon atoms per molecule for all R groups; with

(c) a poly(oxyalkylene)-polyol produced by reacting one or more epoxy-substituted hydrocarbons of the formula



wherein R'' is H or alkyl with the total number of carbon atoms in the molecule being up to 20 and wherein R''' is alkyl or H with the total number of carbon atoms per molecule being up to 20 and wherein m is an integer of from 1 to 10, with a polyol of the general formula

$$Y(OH)_x$$

wherein Y is a hydrocarbon moiety with at least two carbon atoms per moiety and a valence equal to the value of x, x being an integer of at least two.

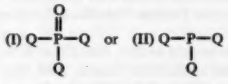
4,113,708

MELT PREPARATION OF 6TA/6IA POLYMERS WITH PHOSPHORUS COMPOUND TO REDUCE AMMONIA FORMATION

Richard D. Chapman; Donald A. Holmer, and George A. Mortimer, all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 14, 1977, Ser. No. 759,313
Int. Cl.[2] C08G *69/28*
U.S. Cl. 528—313 8 Claims

1. In a process for preparing a random copolyamide by melt polymerization of a mixture consisting essentially of (i) hexamethylenediammonium terephthalate and (ii) hexamethylenediammonium isophthalate in a mole ratio of 30:70 to 80:20, respectively, and (iii) from 0 to 15 mole %, based on the moles of (i) and (ii), of a lactam or salt of a diamine of the formula $NH_2 — R' — NH_2$ and a diacid of the formula HOOC — R″ — COOH, where R′ is a C_2 to C_{10} alkylene and R″ is a C_3 to C_{10} alkylene, the improvement comprising adding to said mixture prior to melt polymerization thereof from 20 to 20,000 parts per million, based on the weight of said copolymer, of at least one phosphorus compound whereby the amount of ammonia formed during melt polymerization is reduced, said phosphorus compound or compounds being of the formula



where Q is a hydrogen atom or a radical selected from the group consisting of R, OR, OM and OH wherein R is a hydrocarbon radical and M is an alkali metal atom, with the proviso that each said phosphorus compound has no more than one OH radical and in formula (I) at least one of the Q's is hydrogen.

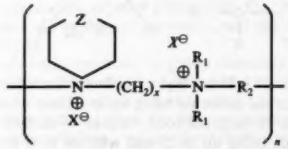
4,113,709

POLYQUATERNARY POLYTHIAZINES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Aug. 12, 1976, Ser. No. 713,666
Int. Cl.[2] C08G *75/24*
U.S. Cl. 424—78 17 Claims

1. Polymers of quaternary thiazines having following recurrent structure



where Z is S, SO, SO_2, x is 2 or more, R_1 is alkyl or hydroxyalkyl or both R_1's may be joined to form a heterocyclic group, R_2 is alkylene, alkenylene, aralkylene, or alkylene ether, X is a halide and n is a number fron 3-500.

17. The reaction product of the polymers of claim 1 with a polystyrene sulfonate.

4,113,710

PROCESS FOR PREPARING SUBSTANTIALLY LINEAR WATER-SOLUBLE INTERPOLYMERIC INTERFACIALLY SPREADING POLYELECTROLYTES

Dale M. Pickelman, Sr., Auburn, and Ritchie A. Wessling, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 706,974, Jul. 19, 1976, abandoned. This application Mar. 10, 1977, Ser. No. 776,167
Int. Cl.[2] C08F *8/34, 8/32, 8/40*
U.S. Cl. 526—30 10 Claims

1. A process for preparing a substantially linear water-soluble interpolymeric interfacially spreading polyelectrolyte in the absence of oppositely charged surfactants wherein:

(A) said polyelectrolyte is composed of a mixture of nonionic hydrophobic units and ionic hydrophilic units wherein said nonionic hydrophobic units are copolymerized ethylenically unsaturated monomers which when in the form of an amorphous homopolymer is less than about 0.1 percent soluble in water and wherein said monomer has no substituent extending more than about 10 Angstrom units from the point of ethylenic unsaturation said units being randomly distributed in the backbone of said polyelectrolyte and wherein said ionic hydrophilic units are copolymerized ethylenically unsaturated monomers which when in the form of amorphous homopolymers are soluble in water and wherein said ionic hydrophilic units remain substantially ionized over a pH range of 0 to 14; and

(B) said polyelectrolyte when incorporated into a dispersion is adsorbed at the disperse phase of said dispersion in a substantially flat configuration and where the area occupied by each ionic hydrophilic unit of said polyelectrolyte at the disperse phase surface is from about 60 to 100 square Angstrom units per ionic hydrophilic unit, and wherein said polyelectrolyte has an adsorption constant equal to or greater than 1 at the point where the disperse phase is saturated with said polyelectrolyte wherein said adsorption constant is determined as the amount of polyelectrolyte in the disperse phase divided by the amount of polyelectrolyte in the continuous phase;

said process comprising (1) the homogeneous polymerization in an aqueous emulsion containing a surfactant and a polymerization initiator of a mixture of ethylenically unsaturated nonionic monomers which monomers form water-insoluble copolymers and wherein at least one of said monomers contains a reactive group to form an interpolymer containing nonionic functional groups, then (2) adding a coreactant compound to said aqueous emulsion in an amount sufficient to convert said interpolymer to a water-soluble polyelectrolyte said polyelectrolyte having a charge which is the same as the charge of the emulsion of (1) above.

4,113,711

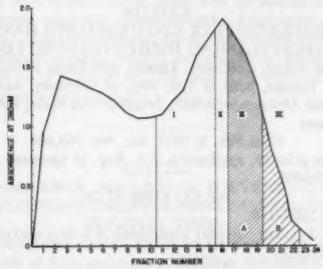
VASOACTIVE LUNG POLYPEPTIDES

Sami I. Said, 5323 Harry Hines Blvd., Dallas, Tex. 75235, and Viktor Mutt, Karolinska Institutet, Stockholm, Sweden

Filed Jan. 19, 1976, Ser. No. 649,968
Int. Cl.[2] B66F *1/04;* A61K *37/00;* C07C *103/52*
U.S. Cl. 260—112 R 1 Claim

1. The active polypeptide characterized as inducing peripheral vasodilation and systemic hypotension, and contracting non-vascular smooth muscle organs and being the fraction of hatched area B of FIG. 2, said polypeptide being a vasoactive material extracted and isolated from the lungs of animals, the process comprising the steps of collecting, boiling and mincing lung portions, extracting the resulting lung portions with acetic acid at a temperature of about 0°–5° C., filtering the resulting extract, and subjecting the extract to alginic acid absorption by the steps comprising lowering the pH with HCl acid and stirring with alginic acid, allowing the alginic acid mixture to settle and discarding supernatant liquid, recovering

the resulting sediment, washing with dilute HCl and eluting from the alginic acid with HCl, adding sodium chloride to the eluate and collecting a salt precipitate, dissolving the salt precipitate in water, neutralizing the resulting solution to a pH of about 7, heating the solution with vigorous stirring and then extracting it with an alcohol, acidifying with mineral acid and collecting an alcoholic extract material, subjecting the alcoholic extract material to gel chromatography over a cross-linked dextran at least one time while dissolved in an organic acid, collecting fractions from the beginning of introduction of the extract into the chromatographic column, combining the recovered fractions, saturating with sodium chloride and salting out the product, collecting the fractions from the gel chromatography in two parts, testing for the most active fractions by tests of femoral blood flow on anesthetized dogs and on isolated smooth muscle organs, subjecting the active fractions to at least one ion-exchange chromatography over carboxymethyl cellulose while dissolved in a buffer solution at a pH of 6–7, centrifuging to eliminate insoluble materials, collecting separate fractions and treating with alginic acid for absorbtion of peptides and eluting with mineral acid, freeze drying and lyophilizing the resulting fractions, and identifying the separate active fractions by characterization on blood flow and smooth muscle organs.



4,113,712

HBsAG PARTICLE COMPOSED OF SINGLE POLYPEPTIDE SUBUNITS AND THE PREPARATION PROCEDURE

Satoshi Funakoshi, Katano, Japan, assignor to The Green Cross Corporation, Osaka, Japan

Filed Mar. 8, 1976, Ser. No. 664,983
Int. Cl.[2] **A61K** *39/12, 39/42;* **C07G** *7/00;* **G01N** *33/16*
U.S. Cl. 260—112 R **8 Claims**

1. A method for the preparation of uniform size hepatitis B surface antigen particles composed of single polypeptide subunits of molecular weight of 55,000 dalton ($HBsAg_{55}$) comprising heating hepatitis B surface antigen for 5 to 120 minutes at 40° to 80° C with a surfactant selected from the group consisting of alkali metal salts of bile acids, alkali metal salts of lauroyl sarcosinic acid, polyoxyethylene alkyl phenol containing an average of 7 to 10 molecules of oxyethylene and polyoxyethylene sorbitan monoalkylester containing an average of 20 molecules of oxyethylene capable of delipidation in isotonic sodium chloride solution at about neutral pH, collecting by gel filtration using a gel of dextran, polyacrylamide or agarose, said antigen particles having a molecular weight of about 2,200,000 dalton as an aqueous solution, and removing surfactant from said aqueous antigen particles solution by dialysis or gel filtration.

4,113,713

METHOD FOR CLEAVING THE PEPTIDE-RESIN BOND IN SOLID PHASE PEPTIDE SYNTHESIS BY HYDROGENOLYSIS

James M. Schlatter, Glenview, and Owen Goodmonson, Chicago, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jun. 16, 1977, Ser. No. 807,083
Int. Cl.[2] **C07C** *103/52;* **C07G** *7/00*
U.S. Cl. 260—112.5 R **2 Claims**

1. In a process for cleaving peptides bound to a polymer by way of benzylester linkage during solid phase peptide synthesis, the improvement comprising hydrogenolysis of said linkage by catalytic hydrogenation using a palladium (II) salt with a weak acid anion as the catalyst.

4,113,714

[DES-ALA[1], GLY[2]-DESAMINO-CYS[3]]SOMATOSTATIN

Victor M. Garsky, Havertown, and William H. McGregor, Malvern, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Jan. 3, 1975, Ser. No. 538,628
Int. Cl.[2] **C07C** *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 S **2 Claims**

1. The compound N^{α}-(3-mercaptopropionyl)-L-Lys-L-Asn-L-Phe-L-Phe-L-Trp-L-Lys-L-Thr-L-Phe-L-Thr-L-Ser-L-Cys cyclic (1–11) disulfide and pharmaceutically acceptable salts thereof.

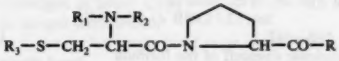
4,113,715

AMINO ACID DERIVATIVES

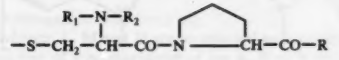
Miguel Angel Ondetti, Princeton, and Michael Edward Condon, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 17, 1977, Ser. No. 759,685
Int. Cl.[2] **C07C** *103/52;* **A61K** *37/00*
U.S. Cl. 260—112.5 R **9 Claims**

1. A compound of the formula



and salts thereof, wherein R is hydroxy or lower alkoxy;
R_1 is hydrogen, lower alkanoyl or amino(imino)methyl;
R_2 is hydrogen, lower alkyl or phenyl-lower alkylene; and
R_3 is hydrogen, lower alkanoyl, benzoyl or



4,113,716

PROCESS FOR PREPARING IMPROVED SOY PROTEIN MATERIALS

Teruo Gomi, Yokohama; Yuji Hisa, and Takahiko Soeda, both of Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,440
Claims priority, application Japan, Apr. 27, 1976, 51-48262
Int. Cl.[2] **A23J** *1/14;* **A23L** *1/20*
U.S. Cl. 260—123.5 **11 Claims**

1. A process for preparing soy protein material having improved solubility which comprises preparing an aqueous slurry of denatured defatted soybean flake material, wherein said aqueous slurry is adjusted to pH 6.5 to 9; heating said aqueous slurry to a temperature in the range of about 110° to 140° C; and subsequently retaining the heated slurry at a temperature in said range for from 2 seconds to 3 minutes; wherein the NSI of said denatured defatted soybean flake material is not more

than 70%, and the NSI of the soy protein in the resultant heated and retained slurry is not less than 75%.

4,113,717

QUATERNIZED AZO DYESTUFFS

Brian Parton, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

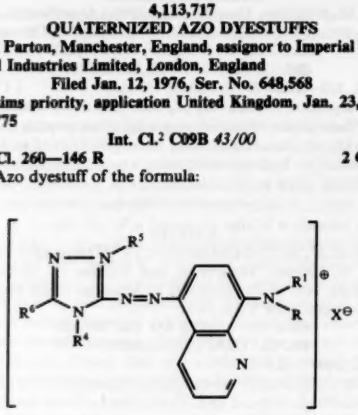
Filed Jan. 12, 1976, Ser. No. 648,568

Claims priority, application United Kingdom, Jan. 23, 1975, 2990/75

Int. Cl.[2] C09B *43/00*

U.S. Cl. 260—146 R **2 Claims**

1. Azo dyestuff of the formula:



wherein X is an anion, R is an alkyl group of from 1 to 6 carbon atoms and R^1 is hydrogen, R^4 and R^5 are optionally substituted alkyl or aralkyl radicals and R^6 is hydrogen or optionally substituted aryl, alkyl or aralkyl group.

4,113,718

BASIC AZO DYES

Peter Loew, Munchenstein, and Stefan Koller, Ramlinsburg, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

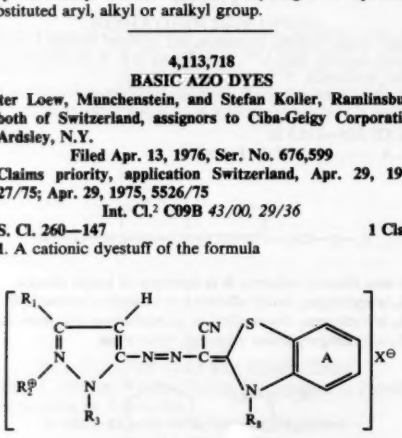
Filed Apr. 13, 1976, Ser. No. 676,599

Claims priority, application Switzerland, Apr. 29, 1975, 5527/75; Apr. 29, 1975, 5526/75

Int. Cl.[2] C09B *43/00, 29/36*

U.S. Cl. 260—147 **1 Claim**

1. A cationic dyestuff of the formula



wherein

R_1 is C_1–C_4 alkyl; C_1–C_4 alkyl substituted by C_1–C_4 -alkoxy, bromo, chloro, phenyl, hydroxy, cyano, —$CONH_2$, N-lower alkyl carboxamide, N,N-dilower alkyl carboxamide, or lower alkoxycarbonyl; phenyl; or phenyl substituted by chloro, bromo, nitro, cyano, lower alkyl, lower alkoxy, lower alkylcarbonylamino, lower alkoxycarbonyl lower alkylaminocarbonyl or trifluoromethyl;

R_2 is C_1–C_5 alkyl; C_1–C_5 alkyl substituted by C_1–C_4 alkoxy, bromo, chloro, phenyl, hydroxy, cyano, —$CONH_2$, N-lower alkyl carboxamide, N,N-dilower alkylcarboxamide or lower alkoxycarbonyl; benzyl; or benzyl substituted by lower alkoxy, lower alkyl, nitro, chloro, bromo or lower alkoxycarbonyl;

R_3 is C_1–C_5 alkyl, C_1–C_5 alkyl substituted by C_1–C_4 alkoxy, bromo, chloro, phenyl, hydroxy, cyano, —$CONH_2$, N-lower alkyl carboxamide, N,N-dilower alkyl carboxamide or lower alkoxycarbonyl; phenyl; phenyl substituted by chloro, bromo, nitro, cyano, lower alkyl, lower alkoxy, lower alkylcarbonylamino, lower alkoxycarbonyl, lower alkylaminocarbonyl, or trifluoromethyl; or benzyl substituted by lower alkoxy, lower alkyl, nitro, chloro, bromo, or lower alkoxycarbonyl;

R_8 is C_1–C_5-alkyl, C_1–C_5-alkyl substituted by C_1–C_4-alkoxy, bromo, chloro, phenyl, hydroxy, cyano, —$CONH_2$, N-lower alkyl carboxamide, N,N-dilower alkyl carboxamide; or benzyl substituted by lower alkoxy, lower alkyl, nitro, chloro, bromo or lower alkoxycarbonyl;

the benzo ring A is unsubstituted or substituted by alkyl of 1–4 carbon atoms, chloro, bromo, nitro, cyano, carboalkoxy of 1–4 carbon atoms, aminosulfonyl or alkoxy of 1 to 4 carbon atoms; and

X is an anion.

4,113,719

1:2-COBALT-COMPLEX AZO DYESTUFFS HAVING AN ACETOACETYLAMINO DIPHENYLAMINO COUPLER

Hermann Fuchs, Kelkheim, Taunus, and Klaüs Filzinger, Hofheim, Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

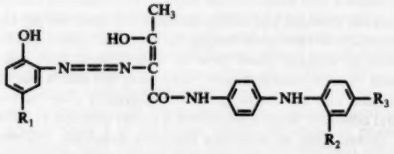
Filed Feb. 2, 1977, Ser. No. 765,004

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1976, 2616405

Int. Cl.[2] C09B *45/20*

U.S. Cl. 260—149 **1 Claim**

1. A 1:2-cobalt complex compound of a monoazo compound of the formula



in which R_1 is halogen, nitro, lower alkyl, a sulfonamido group of the formula —SO_2—NR_4R_5 or a carbonamido group of the formula —CO—NR_4R_5, wherein R_4 and R_5 are identical or different and each is hydrogen or alkyl having 1 to 4 carbon atoms, or R_5 is phenyl unsubstituted or substituted by 1, 2 or 3 substitutents selected from the group lower alkly, lower alkoxy and chlorine, and R_2 is different from R_3 and each is nitro or sulfo.

4,113,720

DISPERSE AZO DYE WITH DIAMINOPYRIMIDINE COUPLING COMPONENT

Johannes Dehnert, and Guenter Dunkelmann, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Continuation of Ser. No. 414,409, Nov. 9, 1973, abandoned. This application Feb. 24, 1976, Ser. No. 660,985

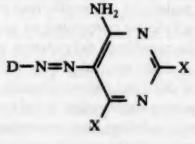
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1972, 2255525

The portion of the term of this patent subsequent to Dec. 24, 1991, has been disclaimed.

Int. Cl.[2] C09B *29/36*; D06P *1/18, 3/36, 3/54*

U.S. Cl. 260—154 **5 Claims**

1. A dye of the formula



where D is phenyl substituted by chlorine, bromine, methyl,

methoxy, nitro, cyano, methylsulfonyl, ethylsulfonyl, phenylsulfonyl, carbalkoxy of 2 to 5 carbon atoms, carbo-β-alkoxyethoxy, said alkoxy having 1 to 4 carbon atoms, or N,N-dialkyl sulfamoyl, said alkyl having 1 to 3 carbon atoms; phenylazophenyl; phenylazophenyl substituted by methyl, chlorine, bromine or nitro; benzthiazolyl; benzthiazolyl substituted by nitro, cyano, methylsulfonyl or ethylsulfonyl; benzisothiazolyl substituted by chlorine, bromine, cyano or nitro; thiazolyl substituted by cyano or nitro; thienyl substituted by methyl, cyano, nitro or carbalkoxy of 2 to 5 carbon atoms; or thiadiazolyl substituted by phenyl, methyl, chlorine, bromine, methylmercapto or alkoxycarbonylethylmercapto, said alkoxy having 1 to 4 carbon atoms; one X is NH_2 and the other X is alkyl of 1 to 6 carbon atoms substituted by alkoxy of 1 to 4 carbon atoms, phenoxy, phenoxyethoxy, benzyloxy, phenyl; cyclohexyl; norbornyl; phenyl; phenyl substituted by methyl, ethyl, methoxy, ethoxy, chloro, bromo, nitro, sulfamoyl or carbamoyl or $(CH_2)_2(OC_2H_4)_nOR$ and R is alkyl of 1 to 4 carbon atoms or benzyl and n is 1 or 2.

4,113,721

WATER-SOLUBLE, NON-POLAR SOLVENT-SOLUBLE ETHYLENEOXY-PROPYLENEOXY CONTAINING FUGITIAL TINTS

Peter Jacob Hauser, Inman, and Hans Heinrich Kuhn, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 609,369, Sep. 2, 1975, abandoned. This application Jul. 13, 1977, Ser. No. 815,122

Int. Cl.[2] **C09B** *11/04, 29/06, 29/08, 35/04*

U.S. Cl. 260—178 **7 Claims**

1. A water-soluble, non-polar solvent-soluble fugitive tint having the formula

$$R[(\text{ethyleneoxy})_n(\text{propyleneoxy})_m]_x$$

wherein R is an organic dyestuff radical, $[(\text{ethyleneoxy})_n(\text{propyleneoxy})_m]$ is a polymer constituent formed by polymerizing n moles of ethylene oxide and m moles of propylene oxide, x is from 1 to 6, said polymer constituent containing from 40 to about 60 mole percent ethyleneoxy units, and the product of $(n + m)_x$ is from 30 to about 200.

4,113,722

STEROIDAL[16α,17-b]BENZODIOXINS

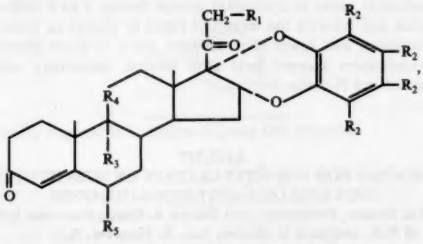
Ravi K. Varma, Belle Mead, and Christopher M. Cimarusti, Hamilton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 11, 1977, Ser. No. 850,514

Int. Cl.[2] **C07J** *5/00*

U.S. Cl. 260—239.55 R **16 Claims**

1. A steroid having the formula



or the 1,2-dehydro derivative thereof, wherein

R_1 is hydrogen, halogen, alkoxy of 1 to 10 carbon atoms, or

wherein Y is alkyl of 1 to 10 carbon atoms or phenyl;

R_2 is halogen or cyano;

R_3 is hydrogen or halogen;

R_4 is carbonyl, β-hydroxymethylene or β-acetyloxymethylene; and

R_5 is hydrogen or fluorine.

4,113,723

15-SUBSTITUTED-ω-PENTANORPROSTAGLANDINS

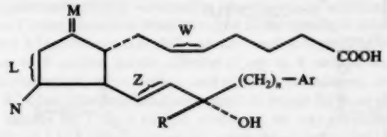
Hans-Jurgen E. Hess, Old Lyme; Michael R. Johnson, Gales Ferry; Jasjit S. Bindra, Groton, and Thomas K. Schaaf, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 705,768, Jul. 15, 1976, division of Ser. No. 633,374, Nov. 19, 1975, Pat. No. 3,980,642, which is a division of Ser. No. 485,596, Jul. 3, 1974, Pat. No. 3,956,284, which is a continuation-in-part of Ser. No. 425,517, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 271,220, Jul. 13, 1972, abandoned. This application Nov. 23, 1977, Ser. No. 854,392

Int. Cl.[2] **C07D** *307/54*

U.S. Cl. 260—347.3 **9 Claims**

1. A compound of the structure:



wherein

Ar is α- or β-furyl; α-

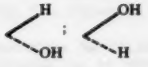
R is hydrogen or lower alkyl;

n is an integer from 0 to 5;

W and L are each a single bond orcis double bond;

Z is single bond;

M is keto



N is hydrogen or α-hydroxy or;

and wherein L, M and N are so selected as to complete the structure of a prostaglandin of the A, E or F series.

4,113,724

ARYLTHIODICYANOPYRAZINES AS PLANT DISEASE CONTROL AGENTS

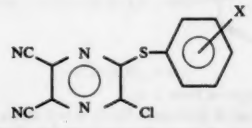
Robert Charles Portnoy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 9, 1977, Ser. No. 805,150

Int. Cl.[2] **C07D** *241/24*

U.S. Cl. 544—408 **6 Claims**

1. A compound of the formula



where X is hydrogen, methoxy or alkyl of 1–4 carbon atoms.

4,113,725
MULTIFUNCTIONAL ADDITIVES

John C. Nnadi, Glassboro, and Israel J. Heilweil, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

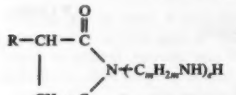
Continuation-in-part of Ser. No. 248,226, Apr. 27, 1972, Pat. No. 3,888,773. This application Apr. 3, 1975, Ser. No. 564,954
Int. Cl.[2] C07D *239/45, 239/50, 401/14, 403/06*
U.S. Cl. 544—296 25 Claims

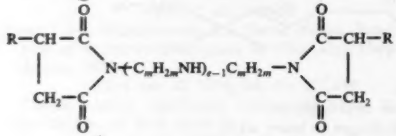
1. A heterocyclic nitrogen compound selected from the class consisting of

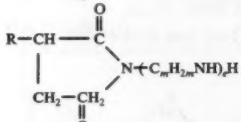
(a) a compound comprising two monovalent amine substituted mononuclear diazine nuclei in which each said monovalent amine substituent is bonded through an amino nitrogen atom to a carbon atom of one of said diazine nuclei, said diazine nuclei being linked one to the other through a bivalent amine radical bonded through an amino nitrogen atom to a carbon atom of each of said diazine nuclei;

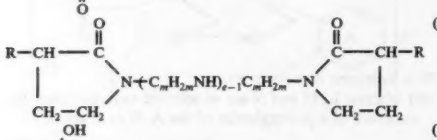
(b) a monovalent amine substituted mononuclear diazine in which said monovalent amine substituent is bonded through an amino nitrogen atom to a carbon atom of the diazine nucleus,

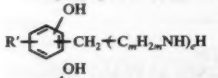
the amine of said monovalent amine substituent being selected from the group consisting of:

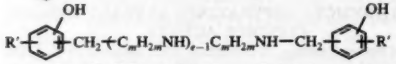

(1)


(2)

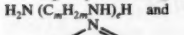

(3)


(4)

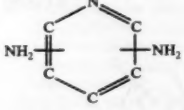

(5)


(6)

the amine of said bivalent amine radical being selected from the group consisting of


(7)

and


(8)

wherein:

m is an integer of from 1 to 3;

e is an integer of from 1 to 10;

R is an alkenyl group containing from 8 to about 300 carbon atoms; and

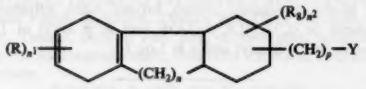
R′ is an alkyl group containing from 8 to about 300 carbon atoms.

4,113,726
PERHYDROFLUORENETETROL AND PERHYDROPHENANTHRENETETROL DERIVATIVES

Frederic Peter Hauck, Somerville, and Christopher Michael Cimarusti, Somerset, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 265,065, Jun. 21, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 446,837
Int. Cl.[2] C07D *295/02, 295/08, 295/14*
U.S. Cl. 544—380 3 Claims

1. A compound of the structure



wherein *n* is 1 or 2; n^1 is 0, 1 or 2; n^2 is 0, 1, 2 or 3; *p* is an integer of from 0 to 10; R is lower alkyl, lower alkoxy, or cycloalkyl; R_8 is hydrogen, lower alkyl, cycloalkyl, di-lower alkylamino-lower alkyl, hydroxy or $R_9O(CH_2)_q$-; q is an integer of from 1 to 10; R_9 is hydrogen, an acyl radical having less than 12 carbon atoms selected from the group consisting of lower alkanoyl, lower alkenoyl, monocyclic aroyl, monocyclic aryl-lower alkanoyl, cycloalkanoyl, cycloalkenoyl, cycloalkyl-lower alkanoyl and cycloalkenyl-lower alkanoyl, lower alkyl, halo-lower alkyl, lower alkoxy-carbonyl, amido or lower alkoxy-alkylene; Y is

wherein R_5 and R_6 may be the same or different and are hydrogen, lower alkyl, lower alkoxy, halo-lower alkyl, monocyclic cycloalkyl, monocyclic cycloalkyl-lower alkyl, lower alkanoyl, halo-lower alkanoyl, hydroxy-lower alkyl, monocyclic aryloyl, monocyclic aryl, or monocyclic aryl-lower alkyl; or

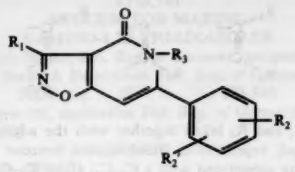
can be taken together to form a 5-, 6- or 7-membered nitrogen heterocyclic radical containing not more than one hetero atom in addition to the nitrogen atom, wherein said additional hetero atom may be oxygen, nitrogen, or sulfur; wherein the term cycloalkyl refers to cycloalkyl groups having 3 to 6 carbon atoms and wherein the term aryl refers to phenyl or phenyl substituted with lower alkyl, halogen, nitro, or lower alkoxy; stereoisomers thereof, acid salts thereof, quaternary salts thereof and N-oxides thereof.

4,113,727
PROCESS FOR THE PREPARATION OF SUBSTITUTED ISOXAZOLO[4,5-c]PYRIDIN-4-(5H)-ONES

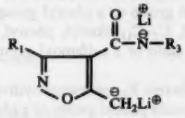
Max Denzer, Parsippany, and Joseph A. Smith, Fanwood, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Apr. 26, 1977, Ser. No. 790,896
Int. Cl.[2] C07D *491/04*
U.S. Cl. 544—362 8 Claims

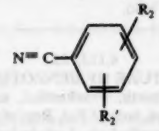
1. A process for preparing a compound of the formula



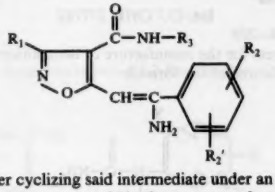
which comprises reacting a compound of the formula



with a compound of the formula

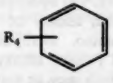


in the presence of an inert organic solvent to form an intermediate of the formula

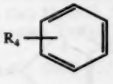


and thereafter cyclizing said intermediate under an inert atmosphere with an inorganic acid in the presence of a water-miscible solvent,

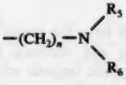
wherein R_1 represents lower alkyl, cycloalkyl, or



where R_2, R_2' and R_4 each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl, lower alkoxy, or trifluoromethyl, and when R_1 represents



and R_2' represents hydrogen, R_2 may also represent



wherein R_5 and R_6 independently represent hydrogen or lower alkyl or together with N represent

where

X is CH_2, O or N-CH_3, and

n is 1 to 3, and

R_3 represents lower alkyl.

4,113,728

2-SUBSTITUTED BENZISOTHIAZOLONES

Keith Howard Baggaley, Redhill, England, assignor to Beecham Group Limited, Great Britain

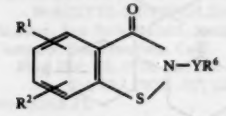
Filed Nov. 2, 1976, Ser. No. 738,000

Claims priority, application United Kingdom, Nov. 18, 1975, 47373/75

Int. Cl.² C07D *217/04, 275/04*

U.S. Cl. 260—283 S **10 Claims**

1. A compound of the formula



(IV)

or a pharmaceutically acceptable non-toxic acid addition salt thereof when there is a basic nitrogen in the molecule wherein R^1 and R^2 are the same or different and each is hydrogen, alkyl of up to 4 carbon atoms, alkoxy of up to 4 carbon atoms, trifluoromethyl, nitro, amino, acetylamino or halogen, or R^1 and R^2 when attached to adjacent carbon atoms form an alkylene moiety of 3 to 6 carbon atoms or an oxy-alkyleneoxy moiety of 1 to 3 carbon atoms; Y is straight- or branched-chain alkylene of 1 to 12 carbon atoms, and R^6 is 3-azabicyclo [3.2.2]non-3-yl, 9-azabicyclo[3.3.1]non-9-yl, 2-azabicyclo[2.2.-2]oct-2-yl, 1,2-benzisothiazol-3-on-2-yl, or tetrahydroisoquinolyl.

4,113,729

3-PHENOXYMORPHINANS AND DERIVATIVES THEREOF

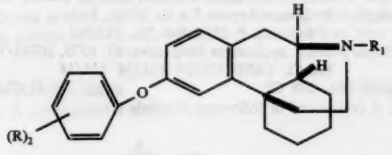
Ernest Mohacsi, Nutley, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 748,022, Dec. 6, 1976, abandoned. This application Jun. 29, 1977, Ser. No. 811,233

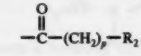
Int. Cl.² C07D *221/28, 217/20*

U.S. Cl. 260—285 **18 Claims**

1. A compound of the formula



wherein R is halo, lower alkyl, lower alkoxy, hydroxy, nitro or hydrogen; R_1 is hydrogen, lower alkenyl containing from 2 to 7 carbon atoms, $—CH_2—(CH_2)_p—R_2$, and



R_2 is phenyl, cyclo-lower alkyl containing from 3 to 6 carbon atoms, or a 5 or 6 membered heteroaromatic ring containing a

hetero atom selected from the group consisting of oxygen, nitrogen and sulfur; *p* is an integer from 0 to 3; and *n* is an integer from 1 to 5; and the lower alkoxy and lower alkyl substituents contain from 1 to 7 carbon atoms and pharmaceutically acceptable salts thereof.

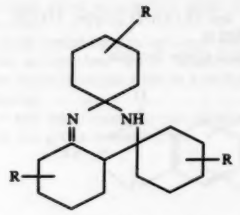
4,113,730

PREPARATION OF OCTAHYDROPHENANTHRIDINES

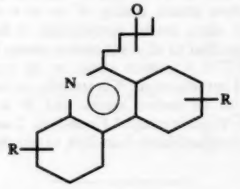
Bernardus A. Oude Alink, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Jul. 5, 1977, Ser. No. 812,888
Int. Cl.² C07D *217/02*
U.S. Cl. 260—286 A **5 Claims**

1. A process of converting 2,3,4,5-tetrahydropyrimidines of the formula



to octahydrophenanthridines of the formula



where R is hydrogen or alkyl of from one to 25 carbon atoms, which comprises the step of heating said tetrahydropyrimidines to a temperature between 75° C. and 350° C. sufficiently high to remove ammonia and hydrogen so as to form said octahydrophenanthridines.

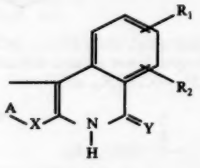
4,113,731

FUSED ISOQUINOLINE DERIVATIVES

Giorgio Winters, and Nunzio DiMola, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Aug. 9, 1976, Ser. No. 713,011
Claims priority, application Italy, Aug. 27, 1975, 26591/75
Int. Cl.² C07D *471/14, 495/14, 513/14*
U.S. Cl. 260—288 CF **21 Claims**

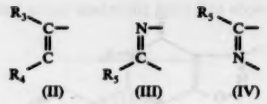
1. A compound of following Formula (I)



(I)

wherein:

A is a divalent radical selected from the groups:



(II) (III) (IV)

wherein R_3 and R_4 taken together with the adjacent C=C double bond, represent an unsubstituted benzene ring or a benzene ring substituted with a C_1–C_{15} alkyl, C_3–C_{15} alkenyl, phenyl, cyano, trifluoromethyl, nitro, sulfo or a sulfamoyl group;

R_5 represents hydrogen, hydroxyl, C_1–C_{15} alkyl or an unsubstituted phenyl group or a phenyl group substituted with a C_1–C_{15} alkyl, C_3–C_{15} alkenyl, phenyl, cyano, trifluoromethyl, nitro, sulfo or a sulfamoyl group;

Y is O;

X is S or NR_6 wherein R_6 represents hydrogen, C_1–C_{15} alkyl or an unsubstituted phenyl group or a phenyl group substituted with a C_1–C_{15} alkyl, C_3–C_{15} alkenyl, phenyl, cyano, trifluoromethyl, nitro, sulfo or a sulfamoyl group;

R_1 and R_2 each independently represents hydrogen, C_1–C_{15} alkyl, alkoxy or halo.

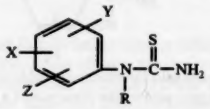
4,113,732

MANUFACTURE OF BENZOTHIAZOLES

Hans-Joachim Opgenorth, Frankenthal, and Horst Scheuermann, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen a. Rhein, Fed. Rep. of Germany

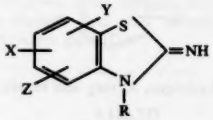
Filed Jun. 29, 1977, Ser. No. 810,950
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631163
Int. Cl.² C07D *277/82*
U.S. Cl. 260—305 **8 Claims**

1. A process for the manufacture of benzothiazoles from an N-phenylthiourea of the formula



I

where X is hydrogen, chlorine, bromine, alkyl of 1 to 4 carbon atoms, alkoxycarbonyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or phenoxy, Y is hydrogen, chlorine, nitro, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, acetylamino, benzoylamino, methylsulfonyl, ethylsulfonyl, cyano, alkoxycarbonyl (where alkoxy is of 1 to 4 carbon atoms) or sulfamoyl which may or may not be substituted by alkyl of 1 to 4 carbon atoms, Z is hydrogen, chlorine, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms and R is hydrogen, alkyl of 1 to 8 carbon atoms, benzyl or phenylethyl, by oxidative ring closure to produce a benzothiazole of the formula II



II

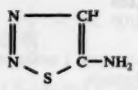
in which X, Y, Z and R have the above meanings, said process comprising contacting and reacting said N-phenylthiourea with chlorine in an aprotic organic solvent in which said N-phenyl-thiourea is dissolved or suspended and in the presence in the reaction mixture of a catalytic amount of bromine or iodine.

4,113,733
PROCESS FOR MAKING 5-AMINO-1,2,3-THIADIAZOLES

Hans Krüger, Berlin, Fed. Rep. of Germany, assignor to Schering AG, Berlin & Bergkamen, Fed. Rep. of Germany

Filed Aug. 9, 1977, Ser. No. 823,526
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1976, 2636994
Int. Cl.[2] C07D *285/06*
U.S. Cl. 260—306.8 D 12 Claims

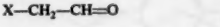
1. A process for making 5-amino-1,2,3-thiadiazoles of the formula



I

the said process comprising

[a] halogenoacetaldehydes of the formula

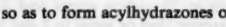


II

or acetals thereof are reacted with hydrazine derivatives of the formula

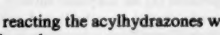
III

so as to form acylhydrazones of the formula



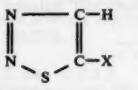
IV

[b] reacting the acylhydrazones with thionylchlorides of the formula



V

so as to form 5-halogeno-1,2,3-thiadiazoles of the formula



VI

and then

[c] reacting the halogen compounds with ammonia whereby the 5-amino-1,2,3-thiadiazole is formed,

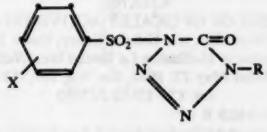
X in these reactions being halogen and R being alkoxy, amino or alkylamino.

4,113,734
MASKED ISOCYANATES

Georges Joseph Smets, Heverlee, and Jean Marie Vandensavel, Tienen, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

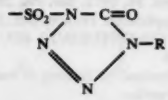
Division of Ser. No. 257,235, May 26, 1972, Pat. No. 3,790,377.
This application Oct. 15, 1973, Ser. No. 406,350
Claims priority, application United Kingdom, Jun. 2, 1971, 18691/71
Int. Cl.[2] C07D *257/06*
U.S. Cl. 260—308 D 2 Claims

1. A compound of the formula:



wherein:

X represents a hydrogen atom, a halogen atom, a nitro group, an alkyl group of 1 to 4 carbon atoms, or a group according to the formula:



and R represents an aliphatic, aromatic or araliphatic hydrocarbon radical.

4,113,735
PROCESS FOR THE PRODUCTION OF N-ACETYL-2-PYRROLIDONE

Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 13, 1976, Ser. No. 750,310
Int. Cl.[2] C07D *207/00*
U.S. Cl. 260—326.5 FL 5 Claims

1. A process for producing N-acetyl-2-pyrrolidone which comprises:

(a) reacting allylamine with acetic acid to thereby obtain N-acetyl-allylamine; and

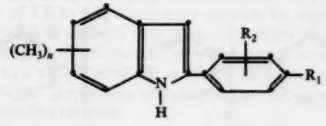
(b) contacting the N-acetyl-allylamine with a catalyst of palladium or platinum, coordinated with an aryl phosphine selected from the group consisting of triphenylphosphine; diphenyl-n-butyl phosphine; tri-(p-methylphenyl)-phosphine and tri-(p-methoxyphenyl)-phosphine, and carbon monoxide in the presence of acetic acid and in the absence of water in a reaction zone, at a temperature between 50° and 200° C and a carbon monoxide partial pressure above 100 psig.

4,113,736
2-PHENYL-INDOLE DERIVATIVES

Charles Pigerol, Saint-Ouen; Paul de Cointet de Fillain, Sisteron, and Souli Nanthavong, Grenoble, all of France, assignors to S. A. Labaz, Brussels, Belgium

Filed Mar. 17, 1976, Ser. No. 667,557
Claims priority, application France, Mar. 21, 1975, 75 08871
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.
Int. Cl.[2] C07D *209/12*
U.S. Cl. 260—326.16 5 Claims

1. A compound of the formula:



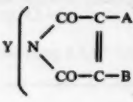
wherein R_1 represents a hydroxy or dodecyloxy group, R_2 represents a hydrogen atom, a methyl or methoxy group and n is 1 or 2, with the proviso that when R_2 represents a hydrogen atom, n is 2.

4,113,737
POLYAMINES WITH IMIDE GROUPS

Maurice Balme, Sainte-foy-les-Lyons, and Max Gruffaz, La Mulatiere, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Oct. 16, 1972, Ser. No. 297,738
Claims priority, application France, Oct. 18, 1971, 71.37311
Int. Cl.[2] C07D 403/10, 403/14
U.S. Cl. 260—326.26 **13 Claims**

1. A polyamine obtained by heating at least one unsaturated polyimide of the formula:

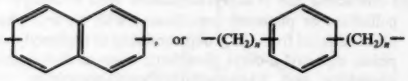


with at least one polyamine of the formula:

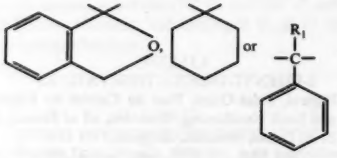
$$Z(NH_2)_b$$

in bulk at a temperature sufficient to initiate a reaction, said temperature being between 50° and 200° C., in which *a* and *b* each independently represents a number ranging from 2 to 4 corresponding to the valency of Y and Z, respectively, Y and Z, which may be identical or different represents either:

a divalent organic radical which is a straight or branched chain alkylene radical with less than 13 carbon atoms, a phyenylene radical or cyclohexylene radical, a radical of one of the formulae:

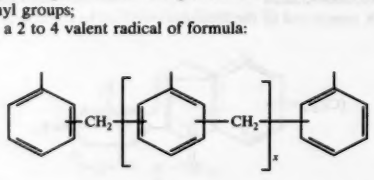


wherein n represents an integer from 1 to 3, or a plurality of phenylene or cyclohexylene radicals joined to one another either by a valency bond or by a group which is one of the following —O—, —S—, an alkylene group with 1 to 3 carbon atoms, —CO—, —SO_2—, —CONH—, —COO—, —P(O)R_1—, —CONH—X—NHCO—,



wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms, phenyl or cyclohexyl and X represents an alkylene radical with less than 13 carbon atoms, the phenylene or cyclohexylene radical being unsubstituted or substituted by methyl groups;

or a 2 to 4 valent radical of formula:



in which *x* is a number from 0.1 to 2,

A and B, which may be identical or different, represents a hydrogen atom, a methyl group or a chlorine atom,

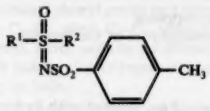
the ratio of the number of NH_2 groups introduced by the polyamine to the number of imide groups introduced by the polyimide being from 1.05 to 2.

4,113,738
CONVERSION OF N-TOSYLSULFOXIMIDES TO SULFOXIMINES

David H. Evans, and Richard B. Greenwald, both of Cambridge, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 764,862, Feb. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 679,487, Apr. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,463, Jun. 30, 1975, abandoned. This application Apr. 5, 1977, Ser. No. 784,669
Int. Cl.[2] C07D 339/08
U.S. Cl. 260—327 M **18 Claims**

1. A method which comprises reacting about 1 molar equivalent of an N-tosylsulfoximide of the formula:



wherein R^1 and R^2 when taken individually (1) each represent an alkyl moiety containing up to 20 carbon atoms, unsubstituted or substituted with an alkali-stable group, or (2) R^1 is an alkyl moiety containing up to 20 carbon atoms and R^2 is $(-CH_2)_n$-S-R^3 wherein n is greater than or equal to 2 and R^3 is an alkyl moiety containing up to 20 carbon atoms and R^1 and R^2 when taken together represent (a) an alkylene moiety having 5 or 6 carbon atoms unsubstituted or substituted with an alkali-stable group; (b) $-(CH_2)_x SO_2 (CH_2)-$ wherein *x* is 3 or 4; or (c) $-(CHR)-SO_2-(CH_2CR'CR''CH_2)-$ where R is hydrogen or R″S$-(CH_2)_y$ wherein R″ *ισ μετηυλ αυδ y* is 0 or a positive integer greater than 1, R′ and R″ when taken individually are hydrogen or methyl and R′ and R″ when taken together are 1,3-dioxolane-2, and at least about 3 equivalents of an alkali metal in liquid ammonia at refluxing ammonia temperatures, to yield the corresponding sulfoximine and isolating said sulfoximine.

4,113,739
PROCESS FOR PREPARATION OF (POLY)CYCLIC POLYETHERS

Roger O. Trucks, and Edwin C. Steiner, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 28, 1974, Ser. No. 437,425
Int. Cl.[2] C07D 493/10
U.S. Cl. 260—338 **11 Claims**

1. In the process of preparing (poly)cyclic polyethers by:

(a) autocondensing a polyoxyalkylene α,ω-halohydrin in the presence of a strong alkali metal base;

(b) condensing, by contacting, a (poly)oxyalkylene α,ω-diol with an alkylene or a (poly)oxyalkylene α,ω-dihalide in the presence of a strong alkali metal base; or

(c) condensing, by contacting, the dialkali metal salt of a (poly)oxyalkylene α,ω-diol with an alkylene or a (poly-)oxyalkylene α,ω-dihalide;

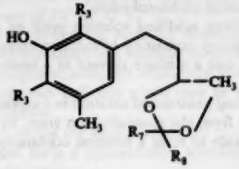
the improvement of effecting the preparation in a hindered alkanol or hindered alkanol mixture the alkanol(s) having from 4 to about 14 carbon atoms.

4,113,740
SYNTHESIS OF OPTICALLY ACTIVE VITAMIN E

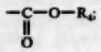
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 17, 1977, Ser. No. 797,712
Int. Cl.[2] C07D 317/10
U.S. Cl. 260—340.9 R **6 Claims**

1. A compound of the formula

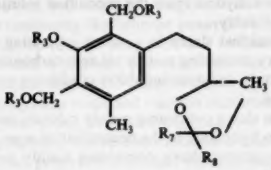


wherein R_3 is methyl or



and R_4, R_7 and R^8 are lower alkyl.

4. A compound of the formula



wherein R_3 is hydrogen or lower alkanoyl; R_7 and R_8 are lower alkyl.

4,113,741

METHOD OF PREPARING PHTHALIDE

Helmut aus der Fünten, Niederkassel, and Wilhelm Vogt, Cologne, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Germany

Filed Apr. 1, 1977, Ser. No. 783,576

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616741

Int. Cl.[2] **C07D** *307/88*

U.S. Cl. 260—343.3 R **8 Claims**

1. Method of preparing phthalide which comprises reacting 3-chlorophthalide with hydrogen at a pressure of about 0.2 to about 100 bars in the presence of a hydrogenation catalyst and in the presence of an HCl acceptor.

4,113,742

PROCESS FOR THE PREPARATION OF ALPHA-PYRONES

Pierre Simon, Sevres, France, assignor to Union Chimique Continentale-U.C.C., Puteaux, France

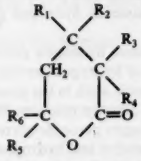
Filed Jun. 14, 1976, Ser. No. 695,751

Claims priority, application France, Jun. 13, 1975, 75 18491

Int. Cl.[2] **C07D** *309/10*

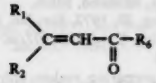
U.S. Cl. 260—343.5 **7 Claims**

1. A process for preparing tetrahydro-α-pyrone of the formula



wherein R_3 is phenyl and R_4 and R_5 are hydrogen, and R_6, R_1 and R_2 are individually H, alkyl, aryl or aralkyl, consisting essentially of:

in a first stage, slowly reacting benzyl cyanide with an alkenone having the formula



at a temperature not exceeding 0° C in the presence of KOH and in an ethanol-hexane mixture to obtain a 4-oxo alkane carbonitrile;

in a second stage, reacting the resultant 4-oxo alkane carbonitrile with an alkanol in the presence of acid to esterify said 4-oxo alkane carbonitrile and thereby obtain the alkyl ester of 5-oxo alkanoic acid; and

in the third stage, saponifying, hydrogenating at superatmospheric pressure in the presence of Raney nickel as catalyst, and cyclizing in the presence of an acid capable of facilitating cyclization, said alkyl ester of 5-oxo alkanoic acid to provide said tetrahydro-α-pyrone.

4,113,743

2-[[6-METHOXY-(3,4-DIHYDRO-2H-1-BENZOPYRANYL)]AMINO]-1-PHENYLPROPANOL HYDROCHLORIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products. Inc., Norwich, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,811

Int. Cl.[2] **C07D** *311/02;* **A01K** *31/35*

U.S. Cl. 260—345.5 **1 Claim**

1. The compound 2-[[6-methoxy-(3,4-dihydro-2H-1-benzopyranyl)]amino]-1-phenylpropanol hydrochloride.

4,113,744

MICROCRYSTALLINE 3-(ALPHA-ACETONYLBENZYL)-4-HYDROXYCOUMARIN (WARFARIN) AND METHODS OF MAKING

Nasri W. Badran, 428 Oxford Rd., New Rochelle, N.Y. 10804, assignor to Nasri W. Badran, New Rochelle, N.Y.

Filed Aug. 13, 1974, Ser. No. 496,932

Int. Cl.[2] **C07D** *311/20*

U.S. Cl. 260—343.44 **12 Claims**

1. Method for the production of warfarin acid crystals having a length of from 0.1 to 4 microns comprising the steps of dissolving warfarin in aqueous solution at an alkaline pH of 7–10 with a buffer selected from the group comprising sodium acetate, ammonium acetate, sodium citrate, phosphates, amines and mixtures thereof, bringing the obtained solution to a specific pH of 8.0 to 9.0, removing impurities by filtration or centrifugation to obtain a clear aqueous solution of the buffered warfarin, and neutralizing the buffer system to bring the solution to a pH of 5.0 to 7.0 at which the microcrystalline warfarin acid precipitates and recovering the precipitated microcrystalline warfarin.

12. Microcrystalline warfarin acid, (3-alpha-acetonyl-benzyl-4-hydroxy coumarin), having a crystal size ranging from 0.1 to 4.0 microns in length, having an average (of 20) crystal length of about 0.62 microns, being translucent, having sharp edges and being needle shaped.

4,113,745
CATALYST FOR AND METHOD OF PRODUCING MALEIC ANHYDRIDE

Edwin J. Strojny, Midland, Mich.; Hans R. Friedli, and Milton S. Wing, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 29, 1977, Ser. No. 828,409
Int. Cl.[2] C07D 307/60
U.S. Cl. 260—346.75 3 Claims

1. A process for preparing maleic anhydride which comprises treating a crude C_5 stream at a temperature of 80° to 100° C for about 8–32 hours, separating the resulting stream by distillation into an overhead stream of isoprene and components boiling below isoprene, and a bottoms stream comprised predominantly of piperylene and closely boiling C_5 hydrocarbons and dicyclopentadiene and its codimers, introducing the said bottoms stream and oxygen or an oxygen-containing gas, into a reaction zone containing a catalyst which comprises a mixture of vanadium oxide, molybdenum oxide, and titanium oxide supported on an inert carrier in an amount to supply from 3–20 weight percent of the mixture having a ratio of $V_2O_5/MoO_3/TiO_2$ of 25 to 60 weight percent V_2O_5, 5 to 40 weight percent MoO_3, 30 to 60 weight percent TiO_2, said carrier being alumina-silica or α-alumina having a surface area of less than about 1 square meter per gram, calcined at about 100° to 500° C over a 2- to 6-hour period maintaining said reaction zone and contents at a temperature between about 380° to about 450° C, maintaining said stream feed to said reaction zone and said oxygen at a gas hourly space velocity per hour ($GHSV/hr^{-1}$) at from between about 1,500 and about 15,000, said C_5 stream being from 0.5 to 1.5 volume percent of said total feed, withdrawing said products, cooling said product stream to condense the organic fraction therefrom, and recovering the maleic anhydride from said condensed fraction.

2. A process for preparing maleic anhydride which comprises treating a crude C_5 stream at a temperature of from 80° to 100° C for from about 8 to 32 hours, separating the resulting stream by distillation into an overhead of isoprene and piperylene and their closely related C_5 components, and a bottoms stream comprised predominantly of dicyclopentadiene and its codimers, introducing said bottoms stream and oxygen or oxygen-containing gas into a reaction zone containing a catalyst which comprises a mixture of vanadium oxide, molybdenum oxide, and titanium oxide supported on an inert carrier in an amount to supply from 3–20 weight percent of the mixture having a ratio of $V_2O_5/MoO_3/TiO_2$ of 25 to 60 weight percent V_2O_5, 5 to 40 weight percent MoO_3, 30 to 60 weight percent TiO_2, said carrier being alumina-silica or α-alumina having a surface area of less than about 1 square meter per gram, calcined at about 100° to 500° C over a 2- to 6-hour period maintaining said reaction zone and contents at a temperature between about 380° to about 450° C, maintaining said stream feed to said reaction zone and said oxygen at a gas hourly space velocity per hour ($GHSV/hr^{-1}$) at from between about 1,500 and about 15,000, said C_5 stream being from 0.5 to 1.5 volume percent of said total feed, withdrawing said products, cooling said product stream to condense the organic fraction therefrom, and recovering the maleic anhydride from said condensed fraction.

4,113,746
PROCESS FOR CONTINUOUS PRODUCTION OF EPICHLOROHYDRIN

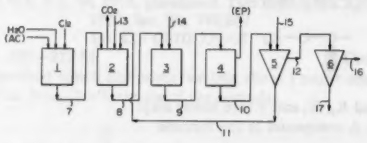
Takamasa Kawabe; Masaaki Kadoma; Kazuyoshi Murakami, and Hatuhide Itoh, all of Kurashiki, Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

Filed Dec. 8, 1976, Ser. No. 748,473
Claims priority, application Japan, Dec. 9, 1975, 50-147062
Int. Cl.[2] C07D 301/26
U.S. Cl. 260—348.22 4 Claims

1. A process for continuously producing epichlorohydrin which comprises reacting chlorine and allyl chloride in an aqueous medium to produce an hydrochloric acid-acidified solution containing glycerol dichlorohydrin,

neutralizing the resulting acidified solution with an alkali selected from the group consisting of calcium carbonate, calcium hydroxide and a mixture thereof in a neutralization zone,

saponifying the resulting neutralized solution in a saponification zone, separate from the neutralization zone, by adding calcium hydroxide to form a solution containing epichlorohydrin,



separating epichlorohydrin from the saponified solution to form a residual slurry,

separating said residual slurry in a slurry separating zone into a first slurry containing mainly calcium carbonate and calcium hydroxide, and a second slurry containing magnesium hydroxide,

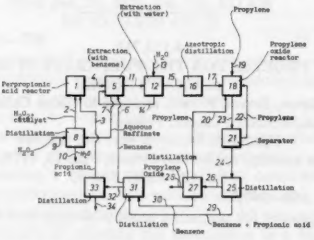
recycling the first slurry containing mainly calcium carbonate and calcium hydroxide to the neutralization zone, and,

withdrawing the second slurry containing mainly magnesium hydroxide.

4,113,747
PROCESS FOR THE PREPARATION OF PROPYLENE OXIDE

Günter Prescher; Gerd Schreyer, both of Hanau; Otto Weiberg, Neu-Isenburg; Rolf Wirthwein, Hanau; Helmut Waldmann, Leverkusen; Hermann Seifert, Cologne; Wulf Schwerdtel, Leverkusen, and Wolfgang Swodenk, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, both of, Germany

Filed Apr. 28, 1976, Ser. No. 678,822
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1975, 2519298
Int. Cl.[2] C07D 301/14
U.S. Cl. 260—348.25 32 Claims



1. Process for the continuous production of propylene oxide from propylene and aqueous hydrogen peroxide which comprises:

(a) contacting aqueous hydrogen peroxide with propionic acid for reaction of hydrogen peroxide and propionic acid to form perpropionic acid, in the presence of a water-soluble acid catalyst for the reaction, the amount of water, catalyst and hydrogen peroxide corresponding to an aqueous solution of catalyst and hydrogen peroxide containing 15 to 45% by weight of catalyst and 25 to 35% by weight of hydrogen peroxide, and the molar ratio of hydrogen

peroxide to propionic acid being 0.8 to 1.5 at a temperature of 10° to 70° C.

(b) extracting the resulting reaction mixture with benzene for formation of a benzene phase rich in perpropionic acid, propionic acid, and containing hydrogen peroxide, and an aqueous raffinate phase rich in hydrogen peroxide and catalyst.

(c) treating the aqueous raffinate to remove water therefrom and form a concentrated solution of hydrogen peroxide and catalyst.

(d) recycling said concentrated solution of hydrogen peroxide and catalyst to step (a),

(e) extracting the benzene phase of step (b) with water or an aqueous solution for formation of a benzene phase containing perpropionic acid, propionic acid, water and a reduced amount of hydrogen peroxide, and an aqueous phase containing hydrogen peroxide.

(f) subjecting the benzene phase produced in step (e) to azeotropic distillation to reduce the water content thereof to less than 0.5% by weight.

(g) contacting the benzene phase of reduced water content of step (f) with propylene at a temperature of 40° to 100° C and a pressure of 2 to 30 bars for reaction of perpropionic acid of the benzene phase with propylene to form propylene oxide and reaction mixture containing the propylene oxide, and other materials,

(h) distilling the reaction mixture is distill overhead propylene, propylene oxide and benzene and removing bottoms comprising benzene and propionic acid;

(i) subjecting the overhead from step (h) to a second distillation to distill off overhead propylene and recycling said propylene to step (g);

(j) introducing the bottoms consisting essentially of propionic acid and benzene from the distillation of step (i) to a third distillation and distilling off overhead benzene and recycling said benzene to step (b),

(k) removing bottoms from said third distillation consisting essentially of propionic acid and materials of higher boiling point than propionic acid and introducing said bottoms into a fourth distillation and distilling over propionic acid and recycling said propionic acid to step (a) and separating bottoms consisting essentially of the material of higher boiling point than propionic acid, and

(l) recovering propylene oxide as a side cut from said second distillation.

4,113,748

FLUORINE AND SULFUR-CONTAINING COMPOSITIONS

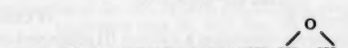
Robert Bonner Hager, Collegeville; Sameeh Said Toukan, Phoenixville, and Gerald Joseph Walter, King of Prussia, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 283,886, Aug. 25, 1972, abandoned. This application Apr. 8, 1974, Ser. No. 459,132

Int. Cl.[2] C07D *303/34*

U.S. Cl. 260—348.43 **1 Claim**

1. An epoxide having the formula



$$(CF_3)_2CFO(CF_2)_y(CH_2)_nSCH_2CH(O)CH_2$$

in which

n is 1–12; and

y is an integer of 1 to 14.

4,113,749

PROCESS FOR PRODUCING ANTHRONE

Ryo Matsuura, Yamato; Shuichi Nakatani, Yokohama; Kazuya Nagaoka, Yokohama, and Katsuhiko Hioki, Yokohama, all of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Filed Jul. 25, 1977, Ser. No. 818,761

Int. Cl.[2] C09B *3/64*

U.S. Cl. 260—351 **15 Claims**

1. A process for producing anthrone which consists essentially of intramolecularly condensing a hydroanthraquinone by heating said hydroanthraquione in vacuo or in the presence of an inert gas, and in the absence of oxygen, wherein said hydroanthraquinone is 1,4,4a,9a-tetrahydroaquinone or 1,4-dihydroanthrahydroquinone and wherein when said hydroanthraquinone is tetrahydroanthraquinone the reaction is effected at a temperature of higher than 200° C and when said hydroanthraquinone is dihydroanthrahydroquinone, the reaction is effected at a temperature of higher than 150° C.

4,113,750

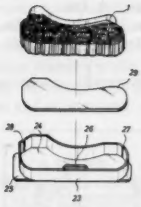
PACK FOR ENDLESS INK RIBBON CARTRIDGE

Minoru Isobe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 28, 1976, Ser. No. 691,200

Int. Cl.[2] B65D *85/67*

U.S. Cl. 206—388 **2 Claims**



1. A pack comprising a case housing an endless ink ribbon in a folded and stacked state therein for use with an endless ink ribbon cartridge having a chamber for housing an endless ribbon for use with a printing means, said case being formed of a rigid material and having a shape and size substantially similar to said chamber, said case comprising an upstanding wall having slits therein for passing a part of said endless ink ribbon to form a strip upon which initial printing will occur, removable packaging material enclosing said case for maintaining said folded and stacked ink ribbon in said case while said pack is inserted in said chamber, pushing place locating inside said case for ejecting said folded and stacked ribbon from said case and pushing said ribbon into said chamber, said packaging material being removed prior to said ink ribbon being inserted into said chamber.

4,113,751

STABILIZER FOR ESTROGENS

Hanfried Arnold, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 731,436, Oct. 12, 1976, abandoned. This application Dec. 17, 1976, Ser. No. 751,676

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1975, 2546063

Int. Cl.[2] C07J *1/00*

U.S. Cl. 260—397.4 **10 Claims**

1. A solid mixture of a storage unstable alkali metal salt of a 3-hemisulfate ester of a 3-hydroxy aromatic A-ring estrogen, and a stabilizing amount of sodium acetate.

4,113,752

METHOD FOR REFINING OF PALM OILS

Haruo Watanabe, Ichikawa, and Masaaki Negishi, Chiba, both of Japan, assignors to Showa Sangyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 183,057, Sep. 23, 1971, abandoned. This application Jun. 17, 1976, Ser. No. 697,192

Int. Cl.[2] C11B *3/04*

U.S. Cl. 260—424 4 Claims

1. A method for the refining of palm-type oils which consists essentially of adding 0.01 to 2.0% by weight of phosphoric acid to a liquid, substantially phosphatide-free crude palm-type oil in which carotinoids remain substantially in a heat sensitive condition, followed by mixing, adding activated clay to the resultant mixture while increasing the temperature of the mixture to around 100° C., maintaining the mixture at a temperature of about 100° C. for about 5 to 30 minutes, separating the clay from the oil and subjecting the oil to decolorization by steam distillation at a temperature of 200°–270° C. while blowing superheated steam into the oil.

4,113,753

TETRA (BICYCLOHEPTYL) TRANSITION METAL COMPOUNDS

Barton Keeley Bower, Nottingham, Pa., assignor to Hercules Incorporated, Wilmington, Del.

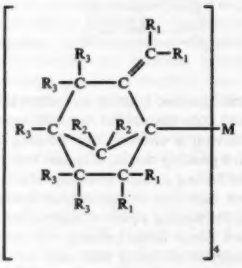
Filed Mar. 25, 1977, Ser. No. 782,265

Int. Cl.[2] C07F *7/28*

U.S. Cl. 260—429.5 7 Claims

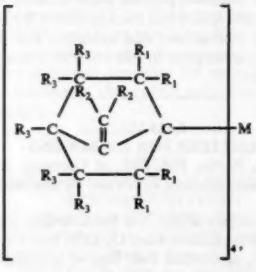
1. A bicyclic organometallic compound having either the formula

I



or the formula

II



wherein M is a transition metal selected from Ti, Zr, Hf, V, Cr, Mn, Fe and Co and wherein the R substituents are either hydrogen or from one to five methyl groups, with the proviso that only one of the R_1's may be methyl, and then only if both of the R_2's are hydrogen.

4,113,754

ISOLATION AND REGENERATION OF RHODIUM-CONTAINING CATALYSTS FROM DISTILLATION RESIDUES OF HYDROFORMYLATION REACTIONS

Rudolf Kummer, Frankenthal; Heinz-Walter Schneider, and Kurt Schwirten, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Mar. 23, 1977, Ser. No. 780,297

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1976, 2614799

Int. Cl.[2] C07F *15/00*

U.S. Cl. 260—429 R 10 Claims

1. A process for isolating and regenerating a catalyst of type I

$$ClRh(CO)(PR_3)_2 \qquad I$$

wherein the R 's are identical or different optionally halogen- or oxygen-substituted hydrocarbon radicals, in a pure form, by regenerating an aqueous rhodium salt solution as obtained on treating a distillation residue of a rhodium-catalyzed hydroformylation reaction product mixture with an oxygen-containing mineral acid and a peroxide, wherein the said aqueous rhodium salt solution is treated with a cation exchanger, the latter is then separated from the solution, the absorbed rhodium ions are desorbed with hydrochloric acid, the hexachlororhodate solution containing hydrochloric acid is reacted in the presence of a water-soluble organic solvent and a tertiary phosphine PR_3 and at from 0° to 150° C. and from 1 to 5 bars with carbon monoxide or with a compound which eliminates carbon monoxide, and the resulting complex I, is separated off.

4,113,755

SYNTHESIS OF PROSTAGLANDIN PRECURSORS

Richard C. Larock, Ames, Iowa, assignor to Iowa State University Research Foundation, Ames, Iowa

Filed May 18, 1977, Ser. No. 798,092

Int. Cl.[2] C07F *15/00*

U.S. Cl. 260—429 L 8 Claims

1. A process of making prostaglandin precursors, which comprises:

reacting a norbornene type compound selected from the group consisting of norbornene, substituted norbornene compounds and norbornene related bicyclic olefins, with an alkenyl mercuric halide, in the presence of a noble metal salt to provide a cis-(beta)-alkenyl bicyclic noble metal salt.

4,113,756

CONVERSION OF MONO-VALENT THALLIUM TO TRI-VALENT THALLIUM

Richard A. Johnson, Midland Park, N.J., assignor to Halcon International, Inc., New York, N.Y.

Filed Nov. 8, 1976, Ser. No. 740,147

Int. Cl.[2] C07F *5/00*

U.S. Cl. 260—429 R 11 Claims

1. In a process for converting a thallium (I) compound to a thallium (III) compound in which the thallium (I) compound is reacted with molecular oxygen in the presence of a Group VIII noble metal, the improvement which comprises effecting said reaction in the presence of a promoter comprising a Group IA metal compound.

4,113,757

TITANIUM COMPOUNDS

Peter Dunlop Kay, Hartlepool, England, assignor to Tioxide Group Limited, Billingham, England

Filed Mar. 3, 1977, Ser. No. 774,140

Claims priority, application United Kingdom, Mar. 13, 1976, 10157/76

Int. Cl.[2] C07F 7/28

U.S. Cl. 260—429.5 3 Claims

1. A titanium chelate comprising a reaction product of an alpha-hydroxy acid selected from the class consisting of lactic acid, alpha-hydroxy butyric acid, citric acid and glyceric acid and a titanate selected from the class consisting of ethylene glycol titanate, propylene glycol titanate, diethylene glycol titanate and hexylene glycol titanate.

4,113,758

PROCESS FOR PREPARING ORGANOTIN HALIDES

John D. Collins, Albrighton, and Trevor E. Jones, Halesowen, both of England, assignors to Albright & Wilson Ltd., Warley, England

Filed Mar. 25, 1977, Ser. No. 781,118

Claims priority, application United Kingdom, Mar. 30, 1976, 12693/76

Int. Cl.[2] C07F 7/22

U.S. Cl. 260—429.7 17 Claims

1. A process for preparing triorganotin halides, which comprises

adding 3 ± 0.3 molar proportions of a cycloalkyl magnesium halide Grignard Reagent in which the cycloalkyl group is selected from the group consisting of cyclohexyl groups and alkyl cyclohexyl groups, in which there are 1–3 alkyl groups each of 1–4 carbon atoms, and in which the halide is selected from the group consisting of chloride, bromide and iodide, to one molar proportion of a stannic halide, in which the halide is selected from the group consisting of chloride, bromide and iodide, the cycloalkyl magnesium halide Grignard Reagent being dissolved in a completely water miscible ether solvent and the stannic halide being in an inert liquid diluent, said ether having a boiling point lower than that of said diluent, the weight percentage of stannic halide to said diluent being between 5% and 25%, the addition being carried out with agitation to form a reaction mixture comprising a tricycloalkyltin halide,

evaporating at least some of said ether from said reaction mixture leaving a mixture depleted of ether,

treating said reaction mixture depleted of ether with an aqueous acid to produce an organic phase comprising tricycloalkyltin halide and inert diluent, and an aqueous phase, and

separating said phases.

4,113,759

METAL-CONTAINING DISAZOMETHINE COMPOUNDS, PROCESS FOR PREPARING THEM AND THEIR USE AS COLORANTS

Theodor Papenfuhs, Frankfurt am Main, and Heinrich Volk, Bad Vilbel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

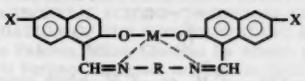
Continuation of Ser. No. 707,876, Jul. 22, 1976, abandoned. This application May 20, 1977, Ser. No. 799,001

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1975, 2533947

Int. Cl.[2] C07F 15/04

U.S. Cl. 260—439 R 8 Claims

1. A metal-complex disazomethine compound of the formula



wherein R is phenylene or phenylene substituted by one or two substituents selected from the group consisting of chlorine, lower alkyl, lower alkoxy, nitro, trifluoromethyl, carboxylic acid (C_1–C_5-alkyl)ester, carbonyl amide, carbonyl phenylamide, acetylamino, benzoylamino, sulfonic acid amide, sulfonic acid (C_1–C_5-alkyl)-amide and sulfonic acid phenylamide, X is carboxy, carboxylic acid (C_1–C_4-alkyl)ester, carboxylic acid amide, carboxylic acid N-(C_1–C_4-alkyl)-amide or carboxylic acid phenylamide, and M is copper, nickel or zinc.

4,113,760

PREPARATION OF ORGANOPOLYSILOXANE POLYMERS

Volker Frey; Rudolf Riedle; Peter John; Gerhard Kalchgruber, all of Burghausen; Helmut Spork, Altotting, and Robert Leser, Burghausen, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jun. 22, 1977, Ser. No. 808,767

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1976, 2630744

Int. Cl.[2] C07F 7/08

U.S. Cl. 260—448.2 E 11 Claims

1. An improved process for equilibrating organosiloxanes by reacting organosiloxanes with chlorosilanes in the presence of a catalyst, the improvement which consists essentially of conducting the equilibration reaction in the presence of a catalyst selected from the class consisting of (a) activated charcoal and (b) activated charcoal and an inorganic acid.

4,113,761

METHOD OF PREPARING ORTHOSILICIC ACID ALKYL ESTERS

Gerhard Kreuzburg, Niederkassel; Arnold Lenz, Koln-Stammheim, and Walter Rogler, Bonn, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Jul. 19, 1976, Ser. No. 706,864

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1975, 2532473; Jul. 19, 1975, 2532475; Jul. 19, 1975, 2532476

Int. Cl.[2] C07F 7/04

U.S. Cl. 260—448.8 A 12 Claims

1. A process for preparing an orthosilicic acid tetraalkyl ester having 2 to 6 C atoms in the ester group which comprises contacting metallic silicon with an alcohol corresponding to the ester group in the presence of the corresponding alkali alcoholate

A. in the additional presence of a surface active substance; or

B. in the additional presence of a compound containing a methoxy group.

4,113,762

METHOD OF MAKING CARBONIC ACID ESTERS

Wolfgang Gaenzler, Darmstadt-Arheilgen; Klaus Kabs, Seeheim, and Günter Schröeder, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 678,698, Apr. 20, 1976, abandoned. This application Aug. 25, 1977, Ser. No. 827,771

Claims priority, application Fed. Rep. of Germany, May 9, 1975, 2520708

Int. Cl.[2] C07C 68/00

U.S. Cl. 260—463 3 Claims

1. A method for making a carbonic acid ester of the formula

wherein R is $-CH_3$, $-C_2H_5$, or $-C_3H_7$, which comprises reacting the corresponding alcohol, ROH, with carbon monoxide and oxygen at a temperature between about 100° and 200° C. and at a pressure between about 10 and 200 atmospheres in the presence of a catalytic amount of a copper-containing catalyst, said catalyst consisting essentially of a complex each molar part of which is formed between one molar part of copper-I-chloride and one molar part of a member selected from the group consisting of vanadium trichloride, chromium trichloride, iron trichloride, cobalt-II-chloride, aluminum trichloride, and silicon tetrachloride.

4,113,763
PROCESS FOR CYANOHYDRIN ESTERS

Richard V. Norton, Wilmington, Del., assignor to Suntech, Inc., Wayne, Pa.

Filed Mar. 10, 1977, Ser. No. 776,452
Int. Cl.² C07C *121/66*
U.S. Cl. 260—465 D **4 Claims**

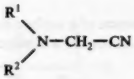
1. A process for making aromatic cyanohydrin esters which consists of adding a lower aliphatic acid anhydride under essentially anhydrous conditions to a mixture of an alkali metal cyanide and an aromatic aldehyde of the structure R-ArCHO, where Ar is a member of the benzene or naphthalene series and R is hydrogen or lower alkyl, said aromatic aldehyde and said cyanide being used in approximate equimolar amounts and said anhydride being used in a molar excess and controlling the exothermic reaction to maintain a temperature between about 0° and 50° C.

4,113,764
MANUFACTURE OF N-SUBSTITUTED GLYCINONITRILES

Harry Distler, Bobenheim; Helmut Schlecht, and Erwin Hartert, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 19, 1976, Ser. No. 743,517
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555769
The portion of the term of this patent subsequent to May 10, 1994, has been disclaimed.
Int. Cl.² C07C *120/00, 120/02*
U.S. Cl. 260—465.5 A **9 Claims**

1. A process for the manufacture of an N-alkylglycinonitrile of the formula



I

where R^1 and R^2 may be identical or different and each is alkyl of 1 to 20 carbon atoms or alkenyl of 2 to 20 carbon atoms, and R^2 may also be hydrogen, which process comprises: reacting an N-alkylamine of the formula

II

where R^1 and R^2 have the above meanings, with formaldehyde and hydrocyanic acid in the presence of water for from 0.1 to 4 hours and at a temperature of from above 40° up to 80° C., the concentration of the hydrocyanic acid during the reaction being not more than 0.1 percent by weight, based on the reaction mixture.

4,113,765
CONTINUOUS PROCESS FOR SULFONATING ALKYL AROMATICS

Eugene E. Richardson, Aurora, and Frank Sidorowicz, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 560,639, Mar. 21, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,842
Int. Cl.² C07C *143/24*
U.S. Cl. 260—505 S **23 Claims**

1. A continuous process for the sulfonation of an alkylaromatic reactant, comprising the following steps:

(a) introducing liquid sulfur trioxide into a vaporizer and heating to a temperature ranging from about 120° F. to about 160° F. at a pressure ranging from about 10 psi to about 70 psi;

(b) mixing a sulfonator - static inline mixer (1) a stream of sulfur trioxide gas produced in step (a) and (2) a reactant stream, comprising an inert solvent solution of the alkylaromatic reactant containing a promoter of about 1 wt.% to about 3 wt.% quantity of sulfuric acid;

(c) mixing the product from step (b), having a temperature of between approximately 130° F. and about 200° F., with water which is introduced into the system as the product passes to a static inline mixer thereby forming an aqueous solution comprising a sulfonation product and aqueous sulfuric acid;

(d) passing the product from step (c) at a pressure ranging from about 2.5 psi to about 5.5 psi through a heat exchanger to produce an aqueous solution comprising a sulfonation product and aqueous sulfuric acid at about 140° F.; and

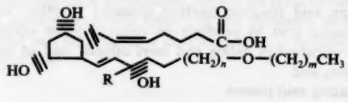
(e) separating the sulfonation product from the aqueous sulfuric acid.

4,113,766
OXAPROSTAGLANDINS

Hans-Jurgen E. Hess, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 355,644, Apr. 30, 1973, which is a continuation-in-part of Ser. No. 259,215, Jun. 2, 1972, abandoned. This application Mar. 26, 1975, Ser. No. 562,208
Int. Cl.² C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the structure:



wherein R is hydrogen or alkyl having 1 to 3 carbon atoms, *n* is an integer of from 0 to 1 and *m* is an integer of from 0 to 4.

4,113,767
PROCESS FOR THE PREPARATION OF ALKALI METAL SALTS OF 3,3-DIMETHYL-2-OXO-BUTYRIC ACID

Walter Merz, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 15, 1975, Ser. No. 640,830
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1974, 2460889
Int. Cl.² C07C *51/04, 51/06*
U.S. Cl. 562—577 **26 Claims**

1. A process which comprises

(1) reacting pinacolone, of the formula

$(CH_3)_3C—CO—CH_3$ (IV),

with a sulfur chloride of the general formula

$$S_nCl_2 \quad \text{(XII)},$$

wherein n is 1 or 2, at a temperature between 0° and 80° C

(2) reacting the reaction mixture directly, without further purification, with an aqueous solution of an amine of the general formula

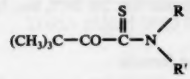
(XIII),

in which

R and R′ which may be identical or different, are each hydrogen, alkyl of from 1 to 8 carbon atoms, cycloalkyl of from 5 to 6 carbon atoms or aryl of from 6 to 10 carbon atoms and which is optionally substituted by methyl or chlorine, or

R and R′ conjointly form a radical $-(CH_2)_m-$ (where m = 4, 5, or 6) or $-(CH_2)_2-O-(CH_2)_2-$, and

(3) hydrolyzing the thus-formed tert.-butyl-glyoxylthioamide of the general formula



(XIV)

wherein R and R′ identified as above without intermediate isolation by adding at least 2 moles of alkali metal hydroxide of the formula MOH per mole of pinacolone (IV) and heating for from 2 to 10 hours at 80° to 150° C, to give an alkali metal salt of 3,3-dimethyl-2-oxo-butyric acid of the formula

$$(CH_3)_3C\text{-}CO\text{-}COO^{\ominus}M^{\oplus} \quad \text{(Ia)},$$

wherein M is an alkali metal.

4,113,768

PREPARATION OF ACRYLIC OR METHACRYLIC ACID FROM ACROLEIN OR METHACROLEIN

James F. White, Akron, and Michael D. Applequist, Mayfield Heights, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 701,259, Jun. 30, 1976, abandoned. This application Dec. 6, 1976, Ser. No. 748,081

Int. Cl.² C07C *51/32*

U.S. Cl. 562—535 **20 Claims**

1. In a process for the preparation of acrylic acid or methacrylic acid by the oxidation of acrolein or methacrolein, respectively, with molecular oxygen in the vapor phase at a reaction temperature of about 200° C to about 500° C in the presence of an oxide catalyst, and optionally in the presence of steam, the improvement comprising

using as the catalyst a catalyst of the formula

$$Mo_{12}P_aBi_bCu_cM_dX_eO_f$$

wherein M is at least one element selected from the group consisting of iron, chromium, nickel, manganese, tellurium, palladium, antimony, rhodium, or mixtures thereof;

X is a halogen selected from the group consisting of chlorine, bromine, or iodine;

and wherein a, b, and c are numbers from 0.001 to 10;

d is from 0 to 10;

e is from 0 to 5;

f is a positive number of oxygens required to satisfy the valence states of the other elements present.

4,113,769

PROCESS FOR PREPARING UNSATURATED CARBOXYLIC ACIDS BY GAS PHASE CATALYTIC OXIDATION OF THE CORRESPONDING ALDEHYDES

Mario Padovan, Milan; Giordano De Alberti, Besnate; Giancarlo Battiston, Baranzate, and Romano Covini, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Oct. 20, 1976, Ser. No. 734,248

Claims priority, application Italy, Oct. 23, 1975, 28606 A/75

Int. Cl.² C07C *51/32*

U.S. Cl. 562—534 **3 Claims**

1. A process for preparing acrylic acid or methacrylic acid comprising reacting in vapor phase acrolein or methacrolein with molecular oxygen or an oxygen-containing gas, at a temperature between 200° and 350° C, in the presence of a solid catalyst, and with a contact time between 0.5 and 5 seconds, characterized in that the solid catalyst consists essentially of molybdenum, vanadium, tungsten, cobalt, chromium and oxygen chemically combined with these elements, the atomic ratios amongst the aforesaid elements being represented by the empirical formula: $Mo_{12}V_aW_bCo_cCr_dO_e$, wherein:

a is between 0.5 and 10,

b is between 0.5 and 8,

c is between 1 and 6,

d is between 0.1 and 3, and

e is a number sufficient to satisfy the valence requirements of the other elements;

and with the further proviso that $a+b+c$ is equal to or greater than 8.5.

4,113,770

PROCESS FOR PREPARING UNSATURATED CARBOXYLIC ACIDS

Shinichi Akiyama, and Haruhisa Yamamoto, both of Takaoka, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 557,170, Mar. 10, 1975, abandoned. This application Mar. 15, 1977, Ser. No. 777,679

Claims priority, application Japan, Mar. 14, 1974, 49-29406

Int. Cl.² C07C *51/32*

U.S. Cl. 562—532 **15 Claims**

1. A process for the preparation of an unsaturated carboxylic acid selected from the group consisting of acrylic acid and methacrylic acid which comprises reacting an unsaturated aldehyde selected from the group consisting of acrolein and methacrolein with molecular oxygen in the vapor phase in the presence of an oxidation catalyst composition having the following empirical formula

$$Mo_aP_bCr_cQ_dL_eO_f$$

wherein Q is at least one element selected from the group consisting of Rb, Cs and K; L is at least one element selected from the group consisting of Sr, Zn, Cd, V, Nb, B, Pb, Bi and W; and a, b, c, d, e and f each represent the number of atoms of each element; the atomic ratio of $a:b:c:d:e$ is 12:0.1–8:0.1–8:0–.1–8:0.01–6; and f is the number of oxygen atoms determined by the valence requirement of the other elements present.

4,113,771

PROCESS FOR THE PURIFICATION OF CITRIC ACID

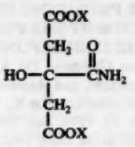
Walter W. Lawrence, Jr., Tom W. McKay, and Karl E. Wiegand, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 325,174, Jan. 19, 1973, which is a continuation-in-part of Ser. No. 131,885, Apr. 7, 1971, Pat. No. 3,770,796. This application Jun. 17, 1977, Ser. No. 807,738

Int. Cl.² C07C *59/16, 101/20*

U.S. Cl. 562—568 **3 Claims**

1. The amide:



where X is H or alkali metal.

4,113,772

METHOD FOR PRODUCING PERFLUOROETHER OLIGOMERS HAVING TERMINAL CARBOXYLIC ACID GROUPS

Richard J. Lagow, 21 Magnolia Ave., Manchester, Mass. 00144, and Shoji Inoue, 1494, Tsuda-machi, Kodaira, Tokyo 187, Japan

Filed Jul. 21, 1975, Ser. No. 597,937
Int. Cl.² C07C 59/22
U.S. Cl. 562—583 8 Claims

1. A process for forming perfluoroether oligomers having terminal carboxylic acid groups comprising:

a. placing a polyether having a molecular weight higher than the desired oligomer product in an enclosed reactor which is maintained at a temperature below the decomposition point of said polyether; and,

b. directly fluorinating said polyether by introducing a source of elemental fluorine into said reactor until said perfluorinated polyether having terminal carboxylic acid groups is formed.

4,113,773

PROCESS FOR THE PRODUCTION OF BENZOYL CYANIDE (I)

Herbert Klenk, Hanau; Theodor Lüssling, Constance; Alfred Maierhofer, Allensbach; Heribert Offermanns, Hanau, and Hans Wagner, Constance, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

Filed Jun. 20, 1977, Ser. No. 802,946
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624891
Int. Cl.² C07C 63/06
U.S. Cl. 260—545 R 22 Claims

1. In a process for preparing benzoyl cyanide by reacting an alkali metal cyanide with benzoyl chloride in the presence of a copper (I) salt the improvement comprising carrying out the reaction at a temperature of about 50° to 160° C. in the presence of a carboxylic acid nitrile inert under the reaction conditions.

4,113,774

N-(DICHLOROACETYL) DIAMINE COMPOUNDS AND PROCESS OF PREPARING SAME

Alexander R. Surrey, Albany, and Joseph C. Collins, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Sep. 9, 1977, Ser. No. 831,942
Int. Cl.² C07C 102/06, 102/22
U.S. Cl. 260—558 D 14 Claims

1. A compound having the formula

where n is 1 or 2.

9. A compound having the formula

$H_2N(CH_2)_nNHCOCHCl_2$

where n is 6 or 8, or acid-addition salt thereof.

4,113,775

TRIAMINOGUANIDINIUM SALT OF TETRANITROETHANE

Louis R. Grant, Los Angeles, and Joseph E. Flanagan, Woodland Hills, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 15, 1976, Ser. No. 732,624
Int. Cl.² C07C 133/10
U.S. Cl. 260—564 G 5 Claims

1. An energetic composition consisting of a triaminoguanidinium salt of tetranitroethane.

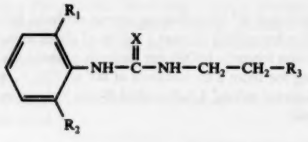
4,113,776

1-(2-AMINOETHYL)-3-(2,6-DIHALOPHENYL)GUANIDINES

Michael Robert Cohen, West Orange; Richard Wightman Kierstead, and Jefferson Wright Tilley, both of North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 763,189, Jan. 27, 1977, Pat. No. 4,066,695, which is a division of Ser. No. 677,106, Apr. 15, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 844,570
Int. Cl.² C07C 133/10, 129/12
U.S. Cl. 260—565 3 Claims

1. A compound of the formula



wherein R_1 and R_2, independently, are halogen; R_3 is amino; and X is imino; or an addition salt thereof with a pharmaceutically acceptable acid.

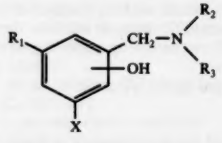
4,113,777

2- OR 4-HYDROXY-3,5-DIHALO-BENZYLAMINES AND SALTS THEREOF

Johannes Keck; Sigfrid Püschmann; Gerd Krüger, all of Biberach an der Riss; Klaus-Reinhold Noll, Warthausen-Oberhofen; Mátyás Leitold, Biberach an der Riss, and Helmut Pieper, Mettenberg, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Division of Ser. No. 635,220, Nov. 25, 1975, Pat. No. 4,073,942, which is a continuation-in-part of Ser. No. 408,071, Oct. 19, 1973, abandoned, and Ser. No. 561,223, Mar. 24, 1975, abandoned. This application Jul. 1, 1977, Ser. No. 812,325
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1972, 2251891; Apr. 26, 1973, 2320967; Sep. 17, 1973, 2346743; Apr. 3, 1974, 2416143
Int. Cl.² C07C 87/28
U.S. Cl. 260—570.9 10 Claims

1. A compound of the formula



wherein

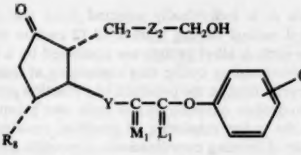
X and R_1 are each chlorine or bromine;
R_2 is isopropyl; tert.butyl; tert.pentyl; mono-, di- or trihydroxy-substituted branched alkyl of 3 to 5 carbon atoms; cyclohexyl; or hydroxycyclohexyl; and
R_3 is alkyl of 1 to 4 carbon atoms or, when R_2 is other than cyclohexyl, also hydrogen;
or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,113,778
2-DECARBOXY-2-HYDROXY-METHYL-ω-PHENOXY-PGE ANALOGS

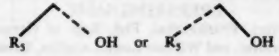
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 647,357, Jan. 8, 1976, Pat. No. 4,055,602. This application Aug. 5, 1977, Ser. No. 822,305
Int. Cl.[2] C07C *49/82, 49/84*
U.S. Cl. 260—590 C **83 Claims**

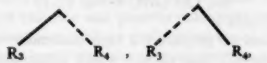
1. A prostaglandin analog of the formula



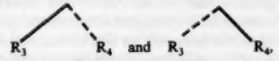
wherein R_8 is hydrogen or hydroxy;
wherein Y is trans-CH=CH—;
wherein M_1 is



wherein R_9 is hydrogen or methyl;
wherein L_1 is



or a mixture of



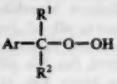
wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein Z_2 is
cis-CH=CH—CH_2-$(CH_2)_g$-CF_2—;
cis-CH_2-CH=CH-$(CH_2)_g$-CH_2—; or
—$(CH_2)_3$-$(CH_2)_g$-CF_2—;
wherein *g* is one, 2, or 3; and
wherein *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl.

4,113,779
PREPARATION OF KETONES

Pierre-Etienne Bost, Paris, and Guy Lartigau, Rhone, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed May 24, 1974, Ser. No. 473,267
Claims priority, application France, May 28, 1973, 73.19288
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—592 **18 Claims**

1. A process for the preparation of an aryl ketone which comprises effecting the catalytic decomposition of a tertiary hydroperoxide of the formula:



(I)

in which Ar represents a monovalent aromatic radical, the free valency of which is carried by a carbon atom belonging to an aromatic ring, and R^1 and R^2, which may be identical or different, each represents a monovalent aliphatic radical or R^1 and R^2 together form a divalent aliphatic radical, in an acidic reaction medium comprising water, a catalytic amount of a water-soluble inorganic or organic cupric salt such that the ratio of the number of mols of hydroperoxide to the number of gram-atoms of copper in the cupric salt is from 5 to 10^4 and a phenol of the formula Ar-OH in which Ar is as defined above, the ratio of the number of mols of phenol to the number of grams of copper in the copper salt being from 0.01 to 2, and at a temperature of from 50° C. to 150° C.

4,113,780
EXTRACTIVE DISTILLATION OF ACETONE

Günter Strehlke, Rheinkamp-Baeri, and Günther Osterburg, Homberg, both of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Feb. 6, 1975, Ser. No. 547,846
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1974, 2405730
Int. Cl.[2] C07C *45/24*
U.S. Cl. 260—593 P **6 Claims**

1. A process for the production of low water content acetone from a feed comprising acetone and water, said feed having been distilled, if necessary, to remove C_6 and lighter volatile material therefrom, which comprises
(a) introducing the feed into the top of the stripping section of a distillation column comprising a rectifying section and a stripping section under distillation conditions comprising a reflux ratio of 2:1 to 10:1 and a column top pressure of 0.5 to 2.0 atmospheres absolute,
(b) introducing isopropyl alcohol, having a water content of 0.1 weight percent maximum, into the rectifying section intermediate the feed inlet and the column top whereby the water-containing acetone is subjected to extractive distillation by said isopropyl alcohol, said isopropyl alcohol addition being 5 to 15 volume percent of the column load,
(c) recovering from the overhead from said column as the product therefrom acetone having a maximum water content of less than 0.2 weight percent, and
(d) recovering from the bottoms from said column a product comprising isopropyl alcohol and water.

4,113,781
PHENYLPROPANALS

Werner Aquila, Mannheim; Werner Hoffmann, Neuhofen; Walter Himmele, Walldorf, and Hardo Siegel, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Fed. Rep. of Germany

Filed Aug. 5, 1974, Ser. No. 494,457
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1973, 2340812
Int. Cl.[2] C07C *47/52*
U.S. Cl. 260—599 **1 Claim**

1. 3-(4-Isopropyl-phenyl)-butanal-1.

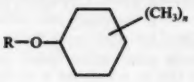
4,113,782

PROCESS FOR THE PREPARATION OF FORMYLATED PHENOXY COMPOUNDS

Imamura Juichi, Chofu; Takehara Masahiko, Chigasaki, and Kizawa Kazuhiro, Kanagawa, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 13, 1976, Ser. No. 657,887
Claims priority, application Japan, Feb. 18, 1975, 50-19458
Int. Cl.[2] C07C *45/00*
U.S. Cl. 260—600 R **14 Claims**

1. A process for the preparation of formylated phenoxy compounds, which comprises oxidizing a methylated phenoxy compound represented by the general formula:



wherein R is a hydrocarbyl group with 1–20 carbon atoms selected from the group consisting of alkyl, cycloalkyl, aryl and aralkyl groups which may be substituted by, hydrocarbyloxy groups with 1–10 carbon atoms, hydrocarbyloxy carbonyl groups and halogen atoms and *n* is an integer of 1–5, in the liquid phase, under heat, with a pressurized oxygen-containing gas in the presence of a reaction solvent selected from the group consisting of lower fatty acids with 1–8 carbon atoms and anhydrides thereof which may be halogen-substituted, said process utilizing: a molar ratio of said reaction solvent to said methylated phenoxy compound of 0.3–18; a catalyst which is at least one salt soluble in said solvent and of a metal selected from the group consisting of cobalt, manganese, chromium and nickel; a molar ratio of said catalyst to said methylated phenoxy compound of 0.001–0.5; a molar ratio of said catalyst to said reaction solvent of 0.0001–1.0; an oxidation reaction temperature within the range of 100°–250° C.; a partial pressure of oxygen within a range of 2–100 kg/cm^2; a reaction rate of conversion of less than about 90%, thereby collectively converting the methyl group of said methylated phenoxy compound into a formyl group.

4,113,783

REDUCTION OF TRIPHENYLPHOSPHINE OXIDE TO TRIPHENYLPHOSPHINE

Dennis B. Malpass, LaPorte, and G. Scott Yeargin, Pasadena, both of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Continuation-in-part of Ser. No. 686,978, May 17, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 805,194
Int. Cl.[2] C07F *9/50*
U.S. Cl. 260—606.5 P **17 Claims**

1. A process for the conversion of triphenylphosphine oxide to triphenylphosphine comprising the steps of

(a) reacting triphenylphosphine oxide with a dialkylaluminum hydride of which the alkyl groups are the same or different and each contain from 1 to 15 carbon atoms in a straight or branched chain; and

(b) hydrolyzing the product of step (a).

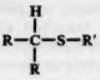
4,113,784

CONVERSION OF ORGANIC SULFIDES TO CORRESPONDING SULFOXIDES

William G. Billings, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 29, 1977, Ser. No. 811,426
Int. Cl.[2] C07C *147/14*
U.S. Cl. 260—607 AR **24 Claims**

9. A process for preparing an organic sulfoxide comprising reacting at least one organic sulfide of the formula



wherein each R is individually selected from the group consisting of hydrogen radicals, hydrocarbon radicals and hydrocarbyl radicals substituted with groups which don't interfere with the reaction or wherein the two R groups are combined to form a hydrocarbyl carbocyclic ring or a carbocyclic ring substituted with groups which don't interfere with the reaction, and wherein R' is selected from the group consisting of hydrocarbyl radicals and hydrocarbyl radicals substituted with groups which don't interfere with the reaction, with at least one hydrocarbyl sulfoxide of the formula

wherein each A is individually selected from the same or different alkyl radical having from 1 to 12 carbon atoms or wherein two such A alkyl groups are combined by a bond to form a sulfur-containing cyclic ring containing at least 4 carbons in the cyclic ring, in the presence of a reaction promoting amount of hydrogen chloride and at least one promoter selected from the group consisting of graphite, covalent metal halide capable of forming coordination compounds, chloroplatinic acid, and noncovalent metal halides.

4,113,785

POLYETHER POLYOLS AND METHOD OF PREPARING SAME

Herbert Helfert, Frankenthal, Fed. Rep. of Germany; Pauls Davis, Gibraltar, and William Keith Langdon, Grosse Ile, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 29, 1976, Ser. No. 736,959
Int. Cl.[2] C07C *41/02, 43/10*
U.S. Cl. 260—615 B **10 Claims**

1. A process for preparing a high molecular weight water soluble polyoxyalkylene polyol, which comprises the following steps in the order given,

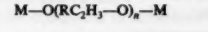
converting a polyoxyalkylene glycol having a molecular weight greater than about 500 to the dialkalialcholate form in substantially complete conversion,

reacting said alcoholate with an alkylene glycol bis glycidyl ether or a polyoxyalkylene glycol bis glycidyl ether under anhydrous conditions at a temperature of from about 25° to about 250° C.,

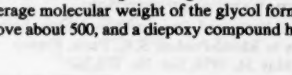
said reactants being combined all at once in equivalent amounts under conditions of mixing for a time sufficient to complete the reaction, and

converting the alcoholate groups in the final mixture to alcohol groups, whereby a primarily straight chain high molecular weight product is obtained.

7. A high molecular weight, water soluble primarily straight chain, polyoxyalkylene polyol obtained by combining equivalent amounts of an alcoholate having the formula:



wherein R is hydrogen or methyl, M is sodium, potassium, or lithium, *n* is an integer having a sufficient value to provide an average molecular weight of the glycol form of the alcoholate above about 500, and a diepoxy compound having the formula:



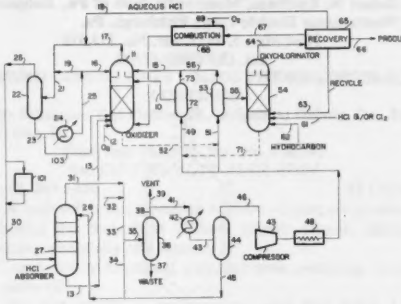
wherein Z is —O—; —O(CH_2)$_p$—O— where p is 2–10; or —O(RC_2H_3—O)$_m$, where R is hydrogen or methyl and m is an integer from 1 to 5, with the reactants combined all at once with mixing at a temperature of from about 25° to about 1250° C., and with the reaction being carried out under substantially anhydrous conditions, and replacing the M groups with hydrogen by ion exchange or acid neutrilization.

4,113,786

HYDROGEN CHLORIDE RECOVERY

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Apr. 2, 1976, Ser. No. 673,095
Int. Cl.[2] C07C *17/00*
U.S. Cl. 260—659 A **7 Claims**



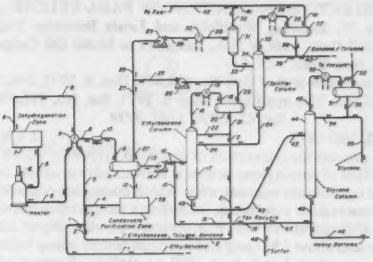
1. A process for recovering hydrogen chloride, comprising:
(a) contacting in an oxychlorination reaction zone aqueous hydrogen chloride and gaseous molecular oxygen with a salt mixture comprising a multivalent metal chloride in its higher and lower valence state to produce a salt mixture enriched in the higher valent metal chloride;
(b) withdrawing a gas containing hydrogen chloride and water vapor from the oxychlorination reaction zone;
(c) cooling the gas to a temperature of from 170° to 250° F, at a pressure of from 1 to 20 atmospheres without condensation of aqueous hydrogen chloride from the gas;
(d) contacting gas from Step (c) having hydrogen chloride and water vapor in an amount whereby condensation would provide an aqueous hydrogen chloride solution containing no greater than 8%, by weight, hydrogen chloride with water to absorb hydrogen chloride and provide a remaining gas having a hydrogen chloride concentration of no greater than 0.01 mole %, said contacting being effected at a gas outlet temperature of from 170° to 250° F, and a pressure of from 1 to 20 atmospheres without condensation of water vapor from the gas, said water being introduced in a quantity to provide an adsorbed aqueous hydrogen chloride solution having a hydrogen chloride concentration of from 10% to 20%, by weight;
(e) passing absorbed aqueous hydrogen chloride solution to the oxychlorination reaction zone;
(f) neutralizing the remaining gas at a temperature of from 170° to 250° F and at a pressure of from 1 to 20 atmospheres; and
(g) venting a portion of the neutralized remaining gas at the temperature of from 170° to 250° F whereby water present in the gas and produced in the oxychlorination reaction zone is vented as water vapor.

4,113,787

AROMATIC HYDROCARBON DEHYDROGENATION PROCESS

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 10, 1977, Ser. No. 758,092
Int. Cl.[2] C07C *15/09, 15/10*
U.S. Cl. 260—669 R **7 Claims**



1. A process for the production of styrene by the dehydrogenation of ethylbenzene which comprises the steps of:
(a) admixing a primary feed stream comprising ethylbenzene with an aqueous stream and a recycle stream comprising ethylbenzene, benzene and toluene to thereby form a combined feed stream;
(b) passing the combined feed stream through a dehydrogenation zone as a vapor, the dehydrogenation zone being maintained at dehydrogenation promoting conditions, and effecting the formation of a dehydrogenation zone effluent stream which comprises ethylbenzene, styrene, toluene, benzene and hydrogen;
(c) cooling and effecting a partial condensation of the dehydrogenation zone effluent stream, and passing the dehydrogenation zone effluent stream into a first phase separation zone maintained at a subatmospheric pressure;
(d) withdrawing a first vapor stream comprising hydrogen, toluene and ethylbenzene from the first phase separation zone;
(e) withdrawing a first hydrocarbon liquid stream and a liquid water stream from the first phase separation zone;
(f) passing the first hydrocarbon liquid stream into an intermediate point of a first fractionation column operated at conditions effective to separate the first hydrocarbon liquid stream into a first overhead vapor stream and a first bottoms liquid stream comprising styrene;
(g) passing the first bottoms stream into a second fractionation column operated at conditions effective to produce an overhead product stream of substantially pure styrene and recovering the latter;
(h) cooling and partially condensing the first overhead vapor stream to effect the formation of a second vapor stream comprising hydrogen, benzene and toluene and a hydrocarbon liquid phase, and removing the hydrocarbon liquid phase as a second hydrocarbon liquid stream comprising benzene, toluene and ethylbenzene, and admixing a portion of the second hydrocarbon liquid stream with the primary feed stream as the aforementioned recycle stream;
(i) admixing and effecting a partial condensation of the first vpaor stream and the second vapor stream to form a mixed-phase stream which is passed into a second phase separation zone;
(j) withdrawing a third vapor stream comprising hydrogen and a third hydrocarbon liquid stream comprising benzene, toluene and ethylbenzene from the second phase separation zone;
(k) passing the third hydrocarbon liquid stream into a third fractionation column operated at conditions effective to produce a net overhead liquid stream comprising benzene

and toluene and a second bottoms stream comprising toluene and ethylbenzene; and,

(I) passing the second bottoms stream into the first fractionation column at an intermediate point above the intermediate point at which the first hydrocarbon liquid stream enters the first fractionation column.

4,113,788

SELECTIVE PRODUCTION OF PARA-XYLENE

Warren W. Kaeding, Westfield, and Lewis Brewster Young, Kendall Park, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 638,861, Dec. 8, 1975, Pat. No. 4,034,053. This application May 3, 1977, Ser. No. 793,470

Int. Cl. C07C *3/03, 3/34*

U.S. Cl. 260—673 **11 Claims**

1. A process for conversion of olefins to xylenes in which the proportion of para-xylene isomer is substantially in excess of its normal equilibrium concentration which comprises contacting, under conversion conditions, including a temperature between about 300° and about 700° F, a pressure between about atmospheric and about 1500 psig and a weight hourly space velocity of between about 1 and about 1000, an olefinic charge stock in which the C_2–C_{10} olefin content is more than 50 volume percent with a catalyst consisting essentially of a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12, said catalyst having combined therewith magnesium in an amount of at least about 0.5 percent by weight, as a result of contact of said zeolite with a magnesium compound in the liquid phase; cooling the resulting product and separating paraxylene therefrom.

4,113,789

HYDROISOMERIZATION OF NORMAL PARAFFIN WITH A CATALYST OF NOBLE METAL, ALUMINA SUPPORT AND CHLORINE

Babu Y. Rao, Fishkill; John T. Nolan, Jr., and John H. Estes, both of Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 3, 1977, Ser. No. 774,099

Int. Cl.[2] C07C *5/30*

U.S. Cl. 260—683.68 **9 Claims**

8. A process for the hydroisomerization of C_4 to C_6 n-paraffin which comprises contacting said paraffin under hydroisomerization conditions with a catalyst comprising an alumina support, about 0.01 to 2.0 weight percent of a noble metal on said support, about 0.1 to 2.0 weight percent alumina on said metal and support and about 3.0 to 15.0 weight percent chlorine, said alumina on said metal and support being effective for retaining said noble metal on the catalyst's surface during the addition of chlorine.

4,113,790

PROCESS FOR THE PREPARATION OF LINEAR ALPHA-OLEFIN OLIGOMERS, SUBSEQUENT HYDROGENATION THEREOF AND SATURATED PRODUCTS THUS OBTAINED

Sebastiano Cesca; Aldo Priola, and Giuseppe Ferraris, all of San Donato Milanese (Milan), Italy, assignors to Snam Progetti, S.p.A., San Donato Milanese (Milan), Italy

Continuation of Ser. No. 601,183, Aug. 1, 1975, abandoned. This application May 9, 1977, Ser. No. 795,225

Int. Cl.[2] C07C *3/10*

U.S. Cl. 260—683.15 B **6 Claims**

1. Process for the preparation of a polymer having a molecular weight of from 200–3000 from a linear alpha-olefin having a carbon atom number of from 3 to 12 wherein the reaction is carried out in the presence of a catalyst system consisting of:

(a) an aluminum halide having the formula AlX_3 in which X is a halogen atom, and

(b) a compound able to react with the aforesaid halides to give the catalyst species capacity to start the polymerization selected from the ones belonging to one of the following classes:

(I) halogen or interhalogen compounds having the general formula X'Y in which X' and Y, the same or different, and are selected from the group consisting of chlorine, bromine, iodine and fluorine; or

(II) a metal halide having the formula BCl_3 said reaction being carried out in the presence of a suspension medium selected from the hydrocarbons having a carbon atom number of from 3 to 12.

4,113,791

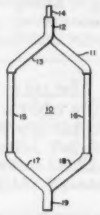
FLUID SOLVENTLESS EPOXY-ANHYDRIDE COMPOSITIONS CONTAINING METAL ACETYLACETONATE ACCELERATORS AND ORGANIC CARBOXYLIC ACID CO-ACCELERATORS

James D. B. Smith, Wilkins Township, Allegheny County, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 3, 1977, Ser. No. 773,875

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—830 TW **8 Claims**



1. A highly fluid, solventless, high voltage capability, resinous impregnating composition consisting essentially of the admixture of:

(A) 100 parts by weight of a resin comprising:

(1) a first epoxy resin consisting of a diglycidyl ether of an aliphatic diol; and

(2) a second epoxy resin selected from the group consisting of bisphenol A epoxy resins, bisphenol F epoxy resins, novolac epoxy resins, glycidyl ester epoxy resins, hydantoin epoxy resins, cycloaliphatic epoxy resins and mixtures thereof, wherein the weight ratio of diglycidyl ether of an aliphatic diol:second epoxy resin is from about 1.0:0.0 to about 1.0:9.0,

(B) about 25 parts to about 200 parts by weight of an organic carboxylic acid anhydride,

(C) about 0.01 part to about 2.0 parts by weight of a metal acetylacetonate selected from the group consisting of chromium (III) acetylacetonate, zirconium (IV) acetylacetonate, and mixtures thereof, acting as a latent accelerator, and

(D) about 0.3 to about 30 parts by weight of an organic carboxylic acid selected from the group consisting of acetic acid, propionic acid, butyric acid, isobutyric acid, valeric acid, caproic acid, heptanoic acid, caprylic acid, benzoic acid, toluic acids, chlorobenzoic acids, nitrobenzoic acids, succinic acid, glutaric acid, adipic acid, pimelic acid, suberic acid, azelaic acid, sebacic acid, phthalic acid, isophthalic acid, terephthalic acid and mixtures thereof, acting as sole co-accelerator, wherein the resinous composition is highly fluid, having an initial viscosity of below about 350 cps. at 25° C.

4,113,792

PRESSURE SENSITIVE ADHESIVE COMPOSITIONS

Stephen D. Pastor, Edison, and Martin M. Grover, Upper Montclair, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jun. 20, 1977, Ser. No. 808,101
Int. Cl.[2] C08L *63/10, 23/34, 67/06;* C08F *255/02*
U.S. Cl. 260—834 21 Claims

1. An improved pressure sensitive adhesive composition comprising

(i) an adhesive base component comprising

(A) from 50 to 85% by weight of an acrylate based pressure sensitive adhesive polymer,

(B) from 4 to 24% by weight of a chlorosulfonated polyethylene, and

(C) from 11 to 40% by weight of a polymerizable low molecular weight vinyl monomer or polymerizable unsaturated oligomer or mixtures thereof; and

(ii) an initiator comprising a condensation reaction product of a primary or secondary amine and an aldehyde to effect curing of the adhesive base component.

4,113,793

RAPID CURING HIGH SOLIDS THERMOSETTING COATINGS

Kazys Sekmakas, Des Plaines, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Sep. 24, 1976, Ser. No. 726,141
Int. Cl.[2] C08L *61/28, 67/02, 67/04*
U.S. Cl. 260—850 13 Claims

1. A high solids thermosetting solution coating composition containing less than about 30% of volatile organic solvent consisting essentially of a mixture of:

(1) an hydroxy functional polyester resin consisting essentially of:

(A) diol having a neo-structure, said diol being 2,2-dimethyl-3-hydroxypropyl-2,2-dimethyl-3-hydroxypropionate;

(B) isophthalic acid; and

(C) a polyhydric alcohol containing at least three hydroxy groups per molecule;

said polyester having an equivalent ratio of hydroxyl to carboxyl functionalities of from 1.35:1 to 2.0:1 and said polyhydric alcohol containing at least three hydroxy groups providing from 5 to 25% of the total hydroxy functionality in said polyester;

(2) liquid low volatile polyhydric alcohol containing from 2–4 hydroxy groups and having an average molecular weight of at least about 350; and

(3) liquid hexafunctional melamine resin;

said polyester constituting from about 30% to 70% of the mixture, said liquid polyhydric alcohol constituting from about 10 to 50% of the mixture, and said liquid melamine resin constituting from 15 to 50% of the mixture.

4,113,794

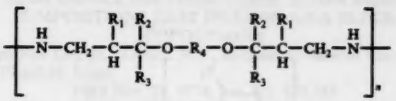
COPOLYMER OF BLOCKS OF RANDOM POLY(DIOXA-AMIDE) AND POLYAMIDE

Robert M. Thompson, Wilmington, Del., and Richard S. Stearns, Malvern, Pa., assignors to Sun Ventures, Inc., Radnor, Pa.

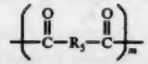
Continuation-in-part of Ser. No. 557,716, Mar. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 415,582, Nov. 14, 1973, abandoned. This application Mar. 16, 1977, Ser. No. 777,999
Int. Cl.[2] C08G *69/40*
U.S. Cl. 260—857 TW 63 Claims

1. A copolymer having a molecular weight of about 5000–100,000 and the following two components:

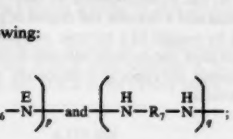
(a) a block component consisting of the following groups:



and



and one of the following:

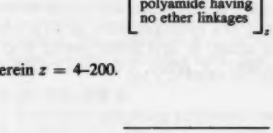


wherein the relative proportions of each are n = 1–10, m = 1–10, p = 0–10 and q = 0–10 and said groups within the block are randomized and wherein the

and the

form an amide linkage; and wherein R_1; R_2 and R_3 are selected from the group consisting of H, C_1–C_{14} alkyls and C_3–C_{10} isoalkyls; R_4 is selected from the group consisting of C_1–C_{10} alkylenes and C_3–C_{10} isoalkylenes; R_5 is selected from the group consisting of C_0–C_{10} alkylenes, C_3–C_{10} isoalkylenes and C_6–C_{10} arylenes; R_6 and R_7 are selected from the group consisting of C_5–C_{11} alkylenes; and wherein said block has a molecular weight of about 350–80,000;

(b) and a block component consisting of



wherein z = 4–200.

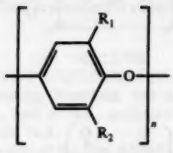
4,113,795

FLAME-RETARDANT POLYPHENYLENE ETHER RESIN COMPOSITION

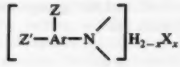
Shinichi Izawa, Tokyo; Jun Sugiyama; Tsutomu Tanaka, both of Yokohama; Atsuo Nakanishi, Kanagawa, and Toranosuke Saito, Kobe, all of Japan, assignors to Asahi-Dow Limited, Tokyo and Sanko Kaihatsu Kagaku Kenkyusho, Osaka, both of, Japan

Filed Jul. 5, 1977, Ser. No. 812,737
Int. Cl.[2] C08K *5/53*
U.S. Cl. 260—874 40 Claims

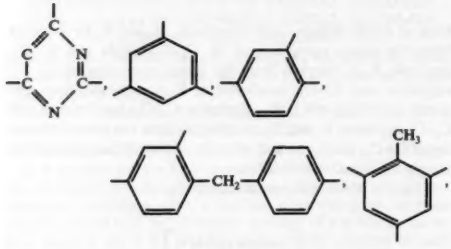
1. A flame-retardant polyphenylene ether resin composition, substantially comprising 80 to 98% by weight of a mixed resin consisting of 20 to 80% by weight of a polyphenylene ether represented by the generic formula:



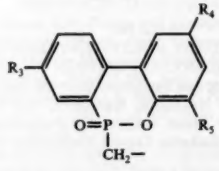
(wherein, R_1 and R_2 each denote an alkyl group having 1 to 4 carbon atoms and n denotes the degree of polymerization) and 20 to 80% by weight of a styrenic polymer and 2 to 20% by weight of at least one member selected from the group consisting of organic phosphorus compounds represented by the generic formula:



(wherein, Ar denotes a trifunctional residue of the formula:



and Z and Z' each denote a monofunctional residue selected from the class consisting of a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an aryl group having 6 to 10 carbon atoms and a $-NH_{2-y}X_y$ group, X denotes a residue of the formula



wherein, R_3, R_4 and R_5 each denote a monofunctional residue selected from the class consisting of a hydrogen atom, a halogen atom, an alkyl having 1 to 8 carbon atoms, an aralkyl group, a cyclohexyl group and a phenyl group, x denotes an integer having the value of 1 or 2 and y denotes an integer having the value of 0, 1 or 2).

4,113,796

PROCESS FOR WORKING UP DISPERSIONS OF ELASTIC-THERMOPLASTIC OR THERMOPLASTIC PLASTICS

(A) Jürgen Bischoff, Dormagen; Friedrich Kowitz; Karl-Heinz Ott, both of Leverkusen; Herbert Schuster; Harry Röhr, both of Cologne, and Hans Weitzel, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 229,182, Feb. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 87,236, Nov. 5, 1970, abandoned. This application Sep. 26, 1973, Ser. No. 400,980

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1969, 1958498

Int. Cl.[2] C08F *6/18, 6/22;* C08L *51/00*

U.S. Cl. 260—876 R 10 Claims

1. A process for working up dispersions of thermoplastic or thermoelastic plastics into a powder of limited water and precipitant content and uniform grain size, said process consisting essentially of the steps of intensively mixing a polymer dispersion and a precipitant under conditions exhibiting a consumption of mechanical energy of 0.2 to 0.6 KWh per m^3 polymer dispersion to thereby generate high turbulence, precipitating polymer particles while maintaining said high turbulence at a temperature below the sintering temperature of the polymer, agglomerating and allowing the resulting polymer particles to harden in the precipitation liquor and separating the agglomerated and hardened polymer particles directly from the precipitation liquor in the form of a powder of uniform grain size, said polymer being selected from the group consisting of polystyrene, a copolymer of styrene and up to two monomers selected from the group consisting of acrylonitrile, methyl methacrylate, α-methyl styrene, other methyl-substituted styrenes and halo-styrene; polymethylmethacrylate; a homopolymer of vinyl chloride; a copolymer of vinyl chloride and vinyl acetate and a mixture containing

(A) from 5 to 100% by weight of a graft copolymer obtained by the graft polymerization of

(a) from 10 to 95% by weight of a mixture of

(i) 50 to 90% by weight of styrene, methyl-substituted styrene, methyl methacrylate or a mixture thereof and

(ii) 50 to 10% by weight of acrylonitrile, methyl-substituted acrylonitrile, methyl methacrylate or a mixture thereof and as grafting substrate

(b) from 90 to 5% by weight of a polymer of a conjugated diolefin containing at least 80% by weight of conjugated diolefin,

and

(B) from 0 to 95% by weight of a thermoplastic copolymer of

(a) from 50 to 95% by weight of styrene, methyl styrene, methyl methacrylate or a mixture thereof, and

(b) from 50 to 5% by weight of acrylonitrile, methyl-substituted acrylonitrile, methyl methacrylate or a mixture thereof,

the total sum of resin-forming monomers in components A and B being at least 40% by weight.

4,113,797

THERMOPLASTIC MOLDING COMPOSITIONS OF RUBBER MODIFIED COPOLYMERS OF A VINYL AROMATIC COMPOUND AND AN α,β-UNSATURATED CYCLIC ANHYDRIDE

Gim Fun Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Mar. 29, 1976, Ser. No. 671,569

Int. Cl.[2] C08L *51/04*

U.S. Cl. 260—876 B 9 Claims

1. A thermoplastic molding composition which comprises an intimate admixture of:

(i) from about 5 to about 95 parts by weight of a rubber-

modified copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride;

(ii) from about 30 to about 1 parts by weight of a block copolymer of a vinyl aromatic compound and a conjugated diene, and

(iii) from 0 to about 95 parts by weight of a polyphenylene ether resin, said composition having improved impact strength and improved tensile elongation in comparison with a corresponding composition in which the copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride is not rubber-modified.

4,113,798

TRANSPARENT ABS POLYBLENDS

James R. Moran, Hampden, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 11, 1975, Ser. No. 612,614
Int. Cl.[2] C08L *55/02*
U.S. Cl. 260—876 R **12 Claims**

1. An improved transparent polyblend composition of:

A. from about 50 to 90 percent by weight of a matrix terpolymer comprising from about 35 to 60 percent by weight of an monovinylidene aromatic monomer, from about 15 to 25 percent by weight of a ethylenically unsaturated nitrile monomer and from about 20 to 45 percent by weight of an acrylate monomer selected from the group consisting of alkyl acrylate and alkyl alkacrylate monomers, and from 10 to 30 percent by weight of,

B. a graft copolymer having a graftable rubber substrate containing a diene rubber forming monomer and a superstrate of a copolymer consisting essentially of a monovinylidene aromatic monomer and an ethylenically unsaturated nitrile monomer, wherein the improvement comprises: said graft copolymer having an average clustered particle size diameter of about 0.3 to 0.6 microns and a superstrate to substrate ratio of 20 to 60:100, said superstrate copolymer comprising at least about 70 percent by weight monovinylidene aromatic monomer and from about 10 to 30 percent by weight of ethylenically unsaturated nitrile monomer, said rubber substrate comprising at least about 70 percent by weight of a conjugated diene monomer and from about 0–30 percent by weight of a monovinylidene aromatic monomer, said graft copolymer being dispersed in said matrix terpolymer as clustered particles providing improved toughness.

4,113,799

ELASTOMERIC SEALANT COMPOSITION

Joel V. Van Ornum, Kirkland, Wash., and Peter L. Stang, Port Tobacco, Md., assignors to Rocket Research Corp., Redmond, Wash.

Filed Jul. 14, 1975, Ser. No. 595,351
Int. Cl.[2] C08L *53/00, 45/00, 23/22*
U.S. Cl. 260—876 B **7 Claims**

1. A sealant composition comprising a reinforced partially cross-linked matrix comprising a high average molecular weight butyl rubber having a molecular weight in the range of approximately 100,000 to 400,000 and a low average molecular weight butyl rubber having a molecular weight in the range of approximately 10,000 to 40,000, in a ratio of high to low molecular weight butyl rubber of between about 35/65 and 45/55, in admixture with a tackifier present in an amount between about 55 and 70 weight % of the composition.

4,113,800

HIGH IMPACT POLYPHENYLENE ETHER RESIN COMPOSITIONS THAT INCLUDE A-B-A BLOCK COPOLYMERS

Gim Fun Lee, Jr., Albany, N.Y., assignor to General Electric, Pittsfield, Mass.

Filed Nov. 25, 1974, Ser. No. 527,142
Int. Cl.[2] C08L *51/00, 53/00*
U.S. Cl. 260—876 B **14 Claims**

1. A thermoplastic molding composition which comprises:

(a) from 10–80 parts by weight of a polyphenylene ether resin;

(b) from 30–65 parts by weight of a block copolymer of an alkenyl aromatic compound and a diene rubber, said copolymer having a major amount of said alkenyl aromatic compound; and

(c) from 5–25 parts by weight of a hydrogenated block copolymer of the A-B-A type wherein A is an alkenyl aromatic block and B is a diene rubber block.

4,113,801

COPOLYMERS OF ALPHA-METHYLSTYRENE AND STYRENE AND USES THEREOF

Paul S. Douglas, Jefferson Township, Fayette County; Anargiros Pete Patellis, Rostraver Township, Westmoreland County, and Walter A. Vredenburgh, Pleasant Hills, all of Pa., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 333,215, Feb. 16, 1973, Pat. No. 3,932,332.
This application Nov. 25, 1975, Ser. No. 636,340
Int. Cl.[2] C08L *51/00*
U.S. Cl. 260—876 B **5 Claims**

1. A new composition of matter comprising a blend of (A) an elastomer selected from the group consisting of styrene-butadiene rubber, block copolymers of styrene and isoprene, and polychloroprene and (B) a copolymer of α-methyl-styrene and styrene having a softening point (ring and ball) between 60° and 100° C., said component (B) being a copolymer produced by the copolymerization of, by weight, from about 90% to about 50% of α-methylstyrene and from about 10% to about 50% of styrene at a temperature range from about 15° C. to about 45° C. in the presence of a Friedel-Crafts catalyst.

4,113,802

PROCESS FOR PREPARING POLYPROPYLENE COMPOSITIONS HAVING HIGH IMPACT STRENGTH AT LOW TEMPERATURES

Mario Matteoli, and Luciano Luciani, both of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 631,526, Nov. 13, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,503
Claims priority, application Italy, Nov. 14, 1974, 29436 A/74
Int. Cl.[2] C08F *297/08*
U.S. Cl. 260—878 B **1 Claim**

1. Process for preparing polymeric compositions containing at least 50% by weight of isotactic polypropylene comprising the following steps:

(a) polymerizing propylene to isotactic polypropylene by polymerizing propylene in a hydrocarbon solvent at a temperature of from 50° C to 80° C and at a pressure between 3 and 10 kg/cm^2 gauge, in the presence of hydrogen and of a stereospecific catalyst comprising the product obtained by mixing a titanium trihalide with a dialkyl aluminum monohalide, to obtain a suspension of substantially isotactic polypropylene in the hydrocarbon solvent;

(b) feeding ethylene continuously into the polymerization suspension while feeding propylene discontinuously into the suspension to obtain, during the propylene feeding, a molar ratio of ethylene to propylene of from 60/40 to 85/15 and, in the feed as a whole, a molar ratio of at least 80/20 between the total amount of ethylene fed and the total amount of propylene fed, both monomers being polymerized at a temperature of from 60° C to 80° C and

at a pressure lower than 10 kg/cm² gauge, until the resulting copolymer makes up from 8% to 18% by weight of the total composition.

4,113,803

ACRYLIC SHEET HAVING IMPROVED THERMOSHAPING PROPERTIES

Brian George Price, Westerhope, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 363,159, May 23, 1973, abandoned. This application May 23, 1975, Ser. No. 580,147

Claims priority, application United Kingdom, Jun. 2, 1972, 25867/72

Int. Cl.² C08L *31/02*

U.S. Cl. 260—885 **8 Claims**

1. A thermoformable acrylic sheet comprising an intimate blend of 10–95% by weight of a acrylic polymer fraction soluble in chloroform having a reduced viscosity of not more than 4.0 and 5–90% by weight of an acrylate polymer fraction wherein the reduced viscosity of the fully polymerized sheet when made in the absence of cross-linking agent is between 1.5 and 4.0, said acrylate polymer fraction containing sufficient cross-linking agent to improve the tensile properties of the sheet in comparison with the sheet made in the absence of cross-linking agent.

4,113,804

COMPOSITIONS COMPRISING POLYBUTENE EPDM AND POLYOLEFIN

Roger C. Cotten, Metairie, La.; David W. Young, Homewood, and Aram Y. Kandanian, Roselle, both of Ill., assignors to Southern Chemical Company, Metairie, La.

Continuation-in-part of Ser. No. 737,423, Nov. 1, 1976, abandoned. This application Nov. 15, 1977, Ser. No. 851,764

Int. Cl.² C08L *23/16*

U.S. Cl. 260—897 A **23 Claims**

1. A composition of matter comprising polybutene-1 as base polymer and an amount sufficient to enhance the working or adhesive characteristics of the composition of a crosslinked, thermoplastic elastomer comprising an EPDM interpolymer elastomer of ethylene, polyene and monoolefin having 3 to about 16 carbon atoms; and a minor amount of polyethylene; with or without normally solid polymer of monoolefin having 3 to about 16 carbon atoms.

4,113,805

THERMOPLASTIC COMPOSITIONS COMPRISING PVC AND CHLORINATED POLYETHYLENE

Hans-Helmut Frey, Bad Soden am Taunus, and Helmut Klug, Aystetten, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 635,326, Nov. 26, 1975, abandoned. This application Nov. 7, 1977, Ser. No. 849,161

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1974, 2456278

Int. Cl.² C08L *23/28*

U.S. Cl. 260—897 C **5 Claims**

1. Thermoplastic composition consisting of

(a) 95 to 70% by weight of a vinyl chloride polymer and

(b) 5 to 30% by weight of a chlorinated high-density polyethylene, wherein the chlorinated high-density polyethylene has a chlorine content of 38 to 42% by weight, a residue value of 55 to 70% by weight (determined by extraction with toluene/acetone in a ratio of 1:1) and a swelling value of less than 1% by weight (measured in methyl-cyclohexane) and has been prepared from high-density polyethylene having a density of 0.955 to 0.965 g/cm³, a melting index MFI 190/5 (DIN 53 735) of 20 to 65 g/10 min. and a reduced specific viscosity (ISO/R 1191) of 1 to 2 dl/g, by chlorinating in water or hydrochloric acid in the presence of 0 to 2% by weight of silicic acid and 0 to 1% by weight of siloxane oil, each time calculated on the high-density polyethylene used, at temperatures of from 50 to 120° C., while introducing at least the last 10% of chlorine at a temperature of from 110° to 120° C.

4,113,806

POLYPROPYLENE IMPACT BLENDS HAVING IMPROVED OPTICAL PROPERTIES

Albert T. Watson, Washington, W. Va., and Robert L. Hull, Minooka, Ill., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 30, 1976, Ser. No. 718,846

Int. Cl.² C08L *23/16*

U.S. Cl. 260—897 A **7 Claims**

1. A polypropylene impact blend having high clarity and a good balance of overall mechanical properties, consisting essentially of:

about 70 to about 95% by weight of polypropylene having a melt flow rate of from about 0.5 to about 30;

about 1 to about 18% by weight of a low density polyethylene having a density of no more than about 0.929 g/cc and a melt index of from about 0.5 to about 50; and

about 2 to about 24% by weight of an amorphous ethylene-propylene copolymer elastomer, with or without a non-conjugated diene, having a combined ethylene content of at least 50% by weight of said elastomer and a Mooney viscosity of from about 40 to about 120 ML 1+8' at 212° F.

4,113,807

ARBUZOV REARRANGEMENT OF TRIPHENYL PHOSPHITE

Ingenuin Hechenbleikner, West Cornwall, and William Palmer Enlow, Falls Village, both of Conn., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 10, 1977, Ser. No. 795,461

Int. Cl.² C07F *9/40*

U.S. Cl. 260—969 **9 Claims**

1. A process for the preparation of diphenyl phenylphosphonate comprising preparing a reaction mixture comprising triphenyl phosphite and minor proportions of each of a metal halide or metal phosphite complex catalyst, and iodobenzene, and heating said mixture at a temperature above about 200° C.

4,113,808

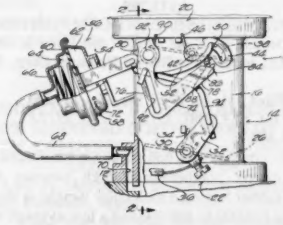
CARBURETOR HAVING AN AUTOMATIC CHOKE

Eugene R. Hackbarth, Kenosha, and Russell J. Van Rens, Milwaukee, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 24, 1977, Ser. No. 780,590

Int. Cl.² F02M *1/14*

U.S. Cl. 261—52 **5 Claims**



1. A carburetor for an internal combustion engine having an intake, said carburetor comprising a body defining an induction passage having an inlet and an outlet adapted to communicate with the engine intake, a choke valve pivotally mounted in

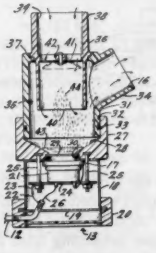
said induction passage and movable between a closed position and an open position to control the admission of air into said induction passage through said air inlet, first biasing means for pivoting said choke valve toward the closed position, a choke lever connected to said choke valve for common pivotal movement therewith between first and second positions corresponding respectively to the open and closed positions of said choke valve, pressure responsive means adapted for communication with the engine intake, means connecting said pressure responsive means to said choke valve for moving said choke valve from the closed position toward the open position in response to the presence of subatmospheric pressure in the engine intake during engine operation, said means connecting said pressure responsive means to said choke valve including a first link connected between said pressure responsive means and said choke lever for pivoting said choke lever, in response to the presence of subatmospheric pressure in the engine intake, toward the second position and thereby to open said choke valve against the closing force of said first biasing means, a throttle valve pivotally mounted in said induction passage between said choke valve and said outlet and movable between an engine idle position and a range of advance speed positions, and means interconnecting said throttle valve and said choke valve for holding said choke valve in the open position independently of said pressure responsive means after said throttle valve is moved from the idle position past a predetermined advance speed position and for permitting said pressure responsive means to be effective for controlling movement of said choke valve when said throttle valve is moved past the pre-determined speed position toward the idle position, said means interconnecting said throttle valve and said choke valve including a choke pull-out lever mounted for pivotal movement between a locked position and a released position wherein said choke pull-out lever engages said choke lever and is operable for pivoting said choke lever toward the second position, second biasing means for pivoting said choke pull-out lever toward the released position and for overcoming said first biasing means, and thereby holding said choke valve in the open position when said choke pull-out lever is in the released position, a throttle lever connected to said throttle valve for common pivotal movement therewith, and means connecting said throttle lever to said choke pull-out lever for locking said choke pull-out lever in the locked position when said throttle lever is located in the idle position or between the idle position and the pre-determined advance speed position, and for permitting said second biasing means to pivot said choke pull-out lever to the released position when said throttle lever is moved from the idle position past the pre-determined advance speed position.

4,113,809

HAND HELD ULTRASONIC NEBULIZER

Raymond L. Abair, and Stanley J. Kulish, Jr., both of Toledo, Ohio, assignors to Champion Spark Plug Company, Toledo, Ohio

Filed Apr. 4, 1977, Ser. No. 784,044
Int. Cl.² A61M *15/00*
U.S. Cl. 261—81 **7 Claims**



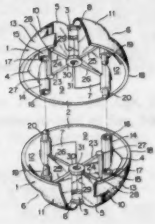
1. An ultrasonic nebulizer comprising, in combination, means defining a liquid reservoir, transducer means for atomizing liquid in the reservoir, said transducer means functioning essentially as a bulk capacitance in parallel with a series resonant circuit when excited within a predetermined frequency range of resonance, said series resonant circuit when excited within such frequency range having a predetermined high resistance when liquid is present in said reservoir and a predetermined lower resistance when mechanically unloaded by the absence of liquid from said reservoir, an oscillator having an output within such frequency range, and means coupling said oscillator output to said transducer means including an inductor, said inductor cooperating with said bulk capacitance and any stray capacitance in circuit with said bulk capacitance to form a series resonant circuit resonating within such frequency range whereby, when liquid is removed from said reservoir, said predetermined low resistance reduces the voltage across said bulk capacitance to in turn reduce power dissipated in such mechanically unloaded transducer means.

4,113,810

DISTILLATION COLUMN PACKING

Reiji Ikawa, Tokyo, Japan, assignor to Tokyo Special Wire Netting Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1977, Ser. No. 809,329
Claims priority, application Japan, Jul. 2, 1976, 51-78733
Int. Cl.² B01F *3/04*
U.S. Cl. 261—98 **2 Claims**



1. A spherical distillation column packing comprising an assembly of one subassembly joined to another subassembly of the same structure as said one subassembly, each of said subassemblies being formed of a hemispherical body having a bowl-like shape and an open end, said hemispherical body including a through-hole formed in the top thereof, a plurality of cutout openings and covering portions formed alternately in the side surface of said hemispherical body, an engaging tube formed on the inner surface of one of said covering portions, an engaging post formed on the inner surface of a different one of said covering portions, said engaging post being shaped to fit into the engaging tube of the other subassembly, a plurality of contact pieces each having one end thereof secured to the outer side of the associated one of said engaging tubes and posts and projecting inwardly of said hemispherical body, said contact pieces having the inner end edges thereof opposed to and spaced from other to define a spacing therebetween so as to not close the interior of said hemispherical body, and a connecting piece connecting the inner end edges of said contact pieces with one another.

4,113,811

PROCESS FOR THE PRODUCTION OF FLEXIBLE EXPLOSIVE FORMED CHARGES

Werner Helfgen, Troisdorf; Gerhard Lindner, Leverkusen; Paul Lingens, Odenthal-Glöbusch, and Helmut Kaufmann, Troisdorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 702,020, Jul. 2, 1976, abandoned. This application Jul. 6, 1976, Ser. No. 702,593.

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1975, 2529432

Int. Cl.² C06B *45/10*

U.S. Cl. 264—3 R **9 Claims**

1. A process for the production of flexible explosive formed charges having a detonation velocity above 6000 m/sec which comprises mixing, without the addition of water, a volatile solvent, or mixtures thereof, a thermoplastic synthetic resin comprising at least one elastomer which exhibits an elongation of at least 800% and a tear strength of between 50 and 350 kp./cm^2 and which comprises a copolymer of ethylene with about 45% by weight of vinyl acetate, a copolymer of acrylonitrile, butadiene and styrene, or a copolymer of an acrylic ester with ethylene, propylene, or vinyl chloride, with a crystalline, high-brisance explosive component having a detonation velocity above 8000 m/sec and at least one plasticizer having a melting point of less than −20° C. and that practically does not evaporate up to a temperature of 90° C., and thereafter forming the mixture into an explosive charge, the high-brisance explosive component being utilized in amounts of 60–85% by weight, the elastomer being employed in amounts of 15–40% by weight, and the ratio of elastomer to plasticizer being between 1:10 and 10:1.

4,113,812

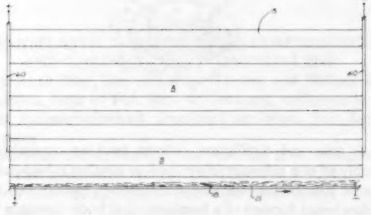
METHOD OF FORMING A COMPOSITE MAT OF DIRECTIONALLY ORIENTED LIGNOCELLULOSIC FIBROUS MATERIAL

John W. Talbott, Moscow, Id., and James D. Logan, Pullman, Wash., assignors to Washington State University Research Foundation, Pullman, Wash.

Filed Dec. 3, 1976, Ser. No. 747,391

Int. Cl.² B29J *5/00*

U.S. Cl. 264—24 **10 Claims**



1. A method of forming a continuous composite mat of directionally oriented lignocellulosic fibrous material, comprising the steps of:

causing a multitude of elongated small pieces of lignocellulosic fibrous material to individually descend as separate and discrete objects into an orienting zone;

said elongated small pieces having a dry weight moisture content of between six percent and twenty percent, with their major dimension along the fiber direction;

moving a horizontal mat-support surface immediately below the orienting zone to receive the descending pieces thereon with the elongated pieces overlapping each other to form a continuous mat;

causing an electric current to flow within the continuous mat to produce a directional electric field immediately above the mat in the orienting zone in which the electric field is substantially parallel with the mat-support surface within the orienting zone and directed in the direction of movement of the mat-support surface tending to orient the longer dimension of the elongated small pieces in the direction of the electric field as the pieces descend through the orienting zone.

4,113,813

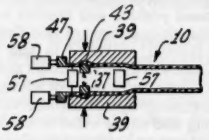
METHOD OF PREPARING AND BELLING THERMOPLASTIC PIPE WITH THICKENED WALLS

Clyde E. Wilson, Brazil, Ind., assignor to Wilson-Tek Corporation, Brazil, Ind.

Filed Apr. 25, 1977, Ser. No. 790,303

Int. Cl.² B29D *23/00*

U.S. Cl. 264—25 **12 Claims**



10. A method of preparing a section of thermoplastic pipe for belling and of forming an enlarged bell on one end portion of the pipe section and a raised annular external rib on said bell defining an internal seal groove in the bell, said method comprising the steps of:

differentially heating said one end portion to provide an intermediate zone of higher temperature and plasticity than the remainder of said one end portion in the area of said one end portion that will form said rib;

expanding said one end portion radially to form the enlarged bell on said pipe section;

axially compressing said one end portion to thicken at least the intermediate zone;

and die-shaping the thickened intermediate zone to the desired final configuration.

4,113,814

METHOD FOR PRODUCING SPECIAL PIPES HAVING LONGITUDINALLY EXTENDING DIAPHRAGM PARTITIONS

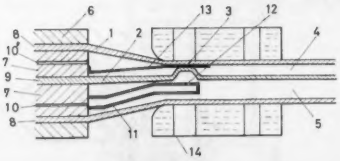
Susumu Kojimoto, Takatsuki; Takami Sato, Toyonaka, and Toshio Mori, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 16, 1976, Ser. No. 723,977

Claims priority, application Japan, Sep. 22, 1975, 50-114969; Sep. 22, 1975, 50-114970

Int. Cl.² B29C *17/02*

U.S. Cl. 264—89 **5 Claims**



1. A method for the production of a thermoplastic resin pipe having a longitudinally extending diaphragm partition dividing the pipe into two conduits with a plurality of longitudinally spaced apart barriers projecting from the diaphragm toward the inside wall of the pipe, said method comprising:

(a) extruding the pipe through an annular opening of a die

head while simultaneously extruding the diaphragm material from a rectangular opening within said annular opening into the central portion of the pipe;

(b) applying a force generally perpendicular to the longitudinal axis of the diaphragm against the diaphragm at a position located downstream of the die head but where the material of the diaphragm is still warm enough to be deformed;

(c) forming said plurality of barriers projecting from the diaphragm by deforming the still warm material with intermittent applications of said generally perpendicular force at spaced intervals of time as the diaphragm material flows past said downstream position.

4,113,815

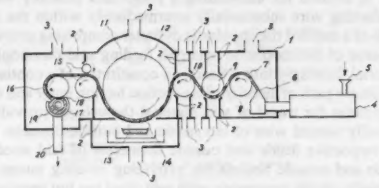
METHOD FOR MANUFACTURING COMPOSITION INCLUDING FINE PARTICLES DISPERSED THEREIN

Yuzo Kawamura, 6-14-304, Honmaru-cho, Ohtsu-shi, Shiga-ken, Japan

Continuation-in-part of Ser. No. 487,581, Jul. 11, 1974, abandoned, which is a continuation of Ser. No. 246,604, Apr. 24, 1972, abandoned, which is a continuation of Ser. No. 40,229, May 25, 1970, abandoned. This application May 21, 1976, Ser. No. 688,639

Int. Cl.[2] B01J *2/24*

U.S. Cl. 264—101 **3 Claims**



1. A method of manufacturing a master batch of a synthetic thermoplastic resin containing flake pigment particles having a substantially smooth mirror surface, a substantially uniform particle size and a diameter/thickness of as large as 1000, comprising

a. moving a thin film of synthetic thermoplastic resin having uniformly controlled thickness through a vacuum chamber,

b. subjecting a mass of the material for forming said pigment particles to evaporation within said vacuum chamber and depositing said evaporated material as a thin film having a uniformly controlled thickness upon one surface of said moving resin film, and

c. heating said moving films to melt said thermoplastic resin film, and

d. subjecting said molten resin and said deposited film to agitation to break up said deposited film into said pigment flake particles within said resin to form said master batch.

4,113,816

PROCESS FOR THE MANUFACTURE OF LAYERED TABLETS INCORPORATING CONTROLLED RELEASE MICROCAPSULES

Yvette Fr. M. J. Estevenel; Maurice H. Thely, both of Paris, and Wladimir A. Coulon, Claye-Souilly, all of France, assignors to Choay S.A., Paris, France

Continuation of Ser. No. 604,029, Aug. 12, 1975, abandoned, which is a division of Ser. No. 487,042, Jul. 10, 1974, Pat. No. 3,922,338. This application Feb. 11, 1977, Ser. No. 767,885

Claims priority, application France, Jul. 12, 1973, 73 25531

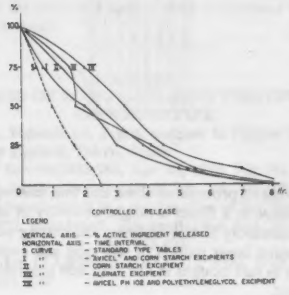
Int. Cl.[2] B29C *6/00*

U.S. Cl. 264—113 **9 Claims**

1. A process of making layered tablets having upper and lower surfaces and a peripheral surface and incorporating controlled-release microcapsules, comprising:

(a) depositing in a tablet-making machine a bottom external layer comprising essentially excipients in granular form and levelling the upper surface of said layer by a tamping action;

(b) depositing on said levelled layer a superposed layer comprising microcapsules containing a pharmaceutically active substance, and similarly levelling said microcapsule layer;



(c) depositing on said levelled microcapsule layer a superposed top external layer comprising excipients in granular form; and

(d) then compressing said superposed layers by a force sufficient to bond the granules and microcapsules without crushing the latter to produce tablets having a hardness of about 10 to 20 kg on the said upper and lower surfaces and about 8 to 15 kg on the peripheral surface.

4,113,817

COAL-CONTAINING SHAPED BODIES AND PROCESS FOR MAKING THE SAME

Carl Kröger, Aachen; Ingo Romey, and Georg Kölling, both of Essen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Continuation of Ser. No. 461,738, Apr. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 238,519, Mar. 27, 1972, abandoned. This application Jan. 16, 1976, Ser. No. 649,920

Claims priority, application Fed. Rep. of Germany, May 18, 1971, 2124555; Apr. 3, 1971, 2116417

Int. Cl.[2] C08L *7/00*

U.S. Cl. 264—120 **19 Claims**

1. A process for making shaped bodies by extrusion or injection molding, the bodies having the form of slabs, sheets, profiles, tubes, pipes or foils,

the said process comprising forming a mixture between (a) coal particles having a size of at most 200 microns and (b) about 10 to 30% by weight of a mixture of an elastomer with a thermoplastic polymer or copolymer,

and shaping said mixture by extrusion or injection molding to its final form at a temperature of about 100° to 250° C.

4,113,818

DRAIN PIPE METHOD

Hubert Drossbach, Rain Am Lech, Fed. Rep. of Germany, assignor to Agro-Drip, Incorporated, Hampton, N.H.

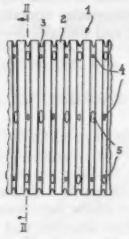
Filed Mar. 2, 1977, Ser. No. 773,766

Int. Cl.[2] B29C *17/10*

U.S. Cl. 264—154 **3 Claims**

1. The method of producing corrugated pipe having water inlet orifices in the troughs of said corrugations characterized by forming corrugations of uniform inner diameter in the wall of said pipe and forming outwardly extending protrusions in

said troughs along a line extending axially along said pipe by providing a forming mold having corrugations with interruptions corresponding to said protrusions and deforming said pipe into said corrugations and said interruptions, said protrusions spaced along said line in troughs alternating with other



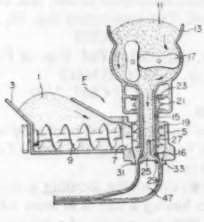
troughs having no protrusions along said line, moving said pipe linearly relative to a cutter arranged inwardly of said protrusions and outwardly of said troughs, and cutting said troughs by said relative linear motion of said pipe and cutter to form said orifices in said troughs in line with said protrusions which remain uncut.

4,113,819

METHOD AND APPARATUS FOR CONTINUOUSLY MANUFACTURING MULTI-LAYERED DOUGH MATERIALS

Torahiko Hayashi, 3-4, Nozawa-machi; Minoru Kageyama, 48-1, Kamitomatsuri-cho, and Michio Morikawa, 67, 1-chome, Yosai-cho, all of Utsunomiya-shi, Tochigi-Ken, Japan

Filed Mar. 9, 1976, Ser. No. 665,326
Claims priority, application Japan, Mar. 10, 1975, 50-29355
Int. Cl.[2] A21D *8/02*
U.S. Cl. 264—173 **5 Claims**



1. A method of continuously manufacturing multi-layered food materials, comprising the steps of:

forming food material continuously into a strip having at least a layer of dough;

folding said strip onto the upper flight of a moving conveyor belt constituting the first in a series of conveyor belts so as to form on said upper flight a pile composed of a plurality of layers of said strip, said upper flight moving generally upwardly along a sloped path; and

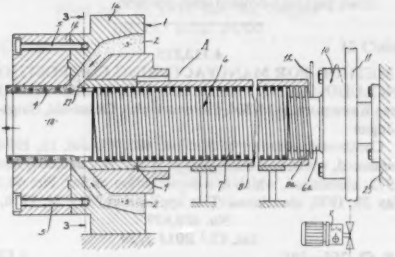
reducing the thickness of said pile by engaging it with a plurality of rollers moving about an endless roller path at a speed faster than any of said conveyor belts, said roller path having a lower straight portion spaced above and partially along the higher end portion of said upper flight and the rest of the conveyor belts in said series thereof.

4,113,820

PROCESS OF THE MAKING OF EXTRUDED THERMOPLASTIC BODIES AND DEVICE FOR THE CARRYING OUT OF THE SAID PROCESS

Ariberto Tamborini, and Giancarlo Tamborini, both of Via 25 Aprile, Daverio, Italy

Division of Ser. No. 460,378, Apr. 12, 1974, Pat. No. 3,969,052. This application Apr. 7, 1976, Ser. No. 674,566
Claims priority, application Italy, May 29, 1973, 24685 A/73
Int. Cl.[2] B29F *3/10*
U.S. Cl. 264—173 **3 Claims**



1. A method for embedding a preformed helically wound reinforcing wire substantially intermediately within the sized walls of a molded thermoplastic cylinder comprising providing a source of thermoplastic material, feeding said thermoplastic material flowingly into a sized run constituted of a continuous rectilinear path of annular cross-section having inner and outer boundaries for travel of said material therealong, providing a helically wound wire of less inside and outside diameter than the respective inside and outside diameters of said sized run inside and outside boundaries, providing rotating means substantially axially concentric with said sized run but terminating spacedly therefrom for externally carrying said helical wire toward said sized run for unsupportedly delivering and feeding to the transverse central portion of said sized run that portion of the wire to be embedded within the thermoplastic material during and concurrently with the feeding of the thermoplastic material to said sized run whereby said reinforcing wire will be located in substantially equally spaced distance from the inner and outer boundaries of the molded thermoplastic cylinder.

4,113,821

PROCESS FOR PREPARING HIGH STRENGTH POLYAMIDE AND POLYESTER FILAMENTARY YARN

William Norman Russell; James Isaac Bruton, both of Colonial Heights, and Ian Charles Twilley, Chesterfield County, all of, Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 689,236, May 24, 1976, abandoned, which is a continuation of Ser. No. 555,494, Mar. 5, 1975, abandoned, which is a continuation of Ser. No. 183,224, Sep. 23, 1971, abandoned. This application Sep. 1, 1977, Ser. No. 829,764
Int. Cl.[2] D01D *5/12*
U.S. Cl. 264—210 F **3 Claims**

1. A process of producing drawn polyethylene terephthalate yarn which comprises continuously melt-spinning at a temperature of about 295° C. filaments of a synthetic linear fiber-forming polyethylene terephthalate polymer having an intrinsic viscosity of at least 0.90 dl., quenching the spun filaments, pretensioning the quenched filaments by subjecting them to a tension of about 0.03 and 0.07 gram per denier at ambient room temperature on pretensioning rolls immediately prior to feed rolls, said feed rolls being maintained at ambient temperature, and thereafter instantaneously and simultaneously heating the pretensioned filaments and drawing them between draw rolls and said feed rolls at a temperature in the range of from about

70° C. to about 250° C. in a heated draw point localizing zone between said feed rolls and said draw rolls.

4,113,822

METHOD OF DISPERSING INORGANIC ADDITIVES WITHIN EXTRUDER

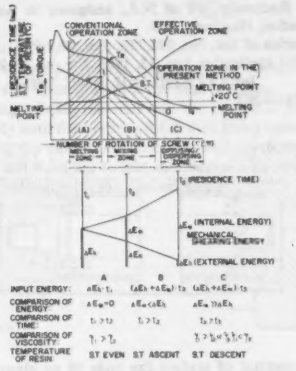
Mamoru Takiura, Kawasaki, and Yoshihiro Hayashizaki, Sagamihara, both of Japan, assignors to Ikegai Tekko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 602,143, Aug. 5, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 773,669

Claims priority, application Japan, Aug. 9, 1974, 49-91224

Int. Cl.[2] B29B *1/04*

U.S. Cl. 264—349 4 Claims



1. A process for uniformly dispersing inorganic additive particles in a synthetic resin that does not decompose at a temperature in the range between its melting point and a temperature 20° C. above its melting point and that possesses the property that when it is molten and agitated in the below-mentioned twin screw extruder its temperature decreases within said temperature range as the speed of rotation of the screws increases within a range of high speed rotation of said screws, which comprises the steps of: continuously feeding a preblended mixture of inorganic additive particles and said synthetic resin in a non-molten state into a twin-screw extruder in which the screws have the same external thread diameter and the threads of the screws intermesh with the exterior of the thread of one screw being radially spaced from the radially opposed portion of the root of the other screw and with the ratio of

$$\frac{\text{radial depth of the zone where the screw threads intermesh}}{\text{external thread diameter of the screws}}$$

being equal to or less than 0.1, and simultaneously rotating said screws at a high speed effective to apply, along the entire lengths of said screws, a uniform high internal mechanical shearing energy to said mixture sufficient initially to break up agglomerates of said inorganic additive particles into primary inorganic additive particles before said resin becomes molten and then after said resin has become molten, wetting the surfaces of the primary inorganic additive particles with the molten resin and dispersing said wetted primary inorganic additive particles in the remainder of the molten resin whereby to form a uniform dispersion of said primary inorganic additive particles in said molten resin, the rotation of the screws being carried out such that the ratio of

$$\frac{\text{actual residence time of at least 90\% the mixture in the extrusion zone}}{\text{the average residence time of the mixture as a whole in the extrusion zone}}$$

is from 0.9 to 1.1, the temperature in the extrusion zone is maintained in the range of from the melting point of the resin to 20° C. above said melting point as a maximum and the speed of rotation of the screws is maintained in the range wherein an increase in the speed of rotation of the screws causes the temperature of the resin in a molten state to decrease within said temperature range.

4,113,823

METHOD OF MANUFACTURING PRESTRESSED CONCRETE PIPE

Hideo Iida, Sagamihara, Japan, assignor to Nippon Hume Pipe Company Limited, Tokyo, Japan

Division of Ser. No. 463,764, Apr. 24, 1974, Pat. No. 3,982,565, which is a continuation-in-part of Ser. No. 393,188, Aug. 30, 1973, abandoned, which is a continuation of Ser. No. 174,787, Aug. 24, 1971, abandoned. This application Aug. 18, 1976, Ser. No. 715,493

Int. Cl.[2] B28B *23/10, 23/12;* F16L *9/08*

U.S. Cl. 264—228 2 Claims

1. A method of manufacturing prestressed concrete pipe in a form comprising the steps of forming a reinforcing cage of laterally spaced longitudinally extending reinforcing members arranged in a circle and wrapping circumferentially extending reinforcement about the exterior surface of the longitudinally extending reinforcing members so that the outside diameter of the reinforcing cage is smaller than the inside diameter of the outer form wall with as little gap as possible between the outside surface of the cage and the inside wall surface of the outer form wall, arranging the longitudinally extending reinforcing members and the circumferentially extending reinforcement so that the effective reinforcement ratio for longitudinally extending reinforcing members is in the range of 0.16 to 0.25% and the circumferentially extending reinforcement is in the range of 1.0 to 1.6%, based on the cross-sectional area of the respective components divided by the cross-sectional area of the concrete inwardly of the center axis of the circumferentially wrapped reinforcement and arranging the ratio of effective reinforcement ratios consisting of the effective reinforcement ratio of the longitudinally extending reinforcement members divided by the effective reinforcement ratio of the circumferentially extending reinforcement in the range of 0.1 to 0.25 so that cracking in the circumferential direction is avoided by maintaining the ratio at more than 0.1 and effective prestressing is attained by maintaining the ratio at less than 0.25, placing the reinforcing cage in the form, casting ordinary concrete within the form and rotating the form for forming a layer of ordinary concrete between the outer periphery of the reinforcing cage and the inner wall surface of the outer form wall, and then casting expensive concrete in the form for filling the form inwardly of the layer of ordinary concrete and encasing the reinforcing cage, and centrifugally forming the pipe.

2. A method of manufacturing prestressed concrete pipe in a form comprising the steps of forming a reinforcing cage of laterally spaced longitudinally extending reinforcing members arranged in a circle and wrapping circumferentially extending

reinforcement about the exterior surface of the longitudinally extending reinforcing members so that the outside diameter of the reinforcing cage formed is smaller than the inside diameter of the outer form wall with as little gap as possible between the outside surface of the reinforcing cage and the inner wall surface of the outer form wall, arranging the longitudinally extending reinforcing member and the circumferentially extending reinforcement so that the effective reinforcement ratios for the longitudinally extending reinforcing members is in the range of 0.16 to 0.25% and in the circumferentially extending reinforcement is in the range of 1.0 to 1.6%, based on the cross-sectional area of the respective reinforcement component divided by the cross-sectional area of the concrete inwardly of the center axis of the circumferentially wrapped reinforcement and arranging the ratio of effective reinforcement ratios consisting of the effective reinforcement ratio of the longitudinally extending reinforcing members divided by the effective reinforcement ratio of the circumferentially extending reinforcement in the range of 0.1 to 0.25 so that cracking in the circumferential direction is avoided by maintaining the ratio at more than 0.1 and effective prestressing is attained by maintaining the ratio at less than 0.25, placing the reinforcing cage in the form, casting expansive concrete within the form with the reinforcing cage disposed outwardly of the center of the wall thickness of the concrete layer and centrifugally forming the pipe.

4,113,824

PROCESS FOR PRODUCING RECEPTACLES FROM A THERMOPLASTIC RESIN FOAM SHEET

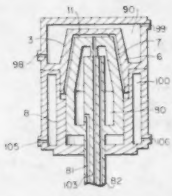
Takashi Matsui, Nara; Sadao Sugimura, Gose, and Kunio Noo, Nara, all of Japan, assignors to Sekisui Kaseikin Kogyo Kabushiki Kaisha, Nari, Japan

Filed Jul. 8, 1976, Ser. No. 703,421

Claims priority, application Japan, Jul. 11, 1975, 50-85549

Int. Cl.[2] B29C *13/00*

U.S. Cl. 264—230 **24 Claims**



1. A method for producing a receptacle from a thermoplastic resin foam sheet, which comprises

forming a cylindrical article by bonding the opposite sides of a rectangular-shaped unidirectionally shrinkable thermoplastic resin foam sheet which, when heated, shrinks in a first direction to a greater extent than in a direction perpendicular to said first direction, so that when heated, a resulting cylindrical article will shrink toward the central axis thereof,

fitting said cylindrical article over a male mold having a cylindrical lower portion, with an end portion of said cylindrical article extending beyond the flat end surface of the male mold,

heating said cylindrical article to a temperature above the softening point of the resin of said sheet, whereby said cylindrical article shrinks toward the central axis thereof and intimately contacts said male mold to form an apertured article having a flat annular portion continuous with the initial peripheral side wall,

placing a flat bottom plate onto said flat annular portion,

compression-molding under heat said apertured article together with said flat bottom plate by means of a male mold and a female mold, a pair of which molds, when clamped, defining a clearance that is less than the thickness of the initial peripheral side wall of said apertured article, and said molds having at least one annular ridge, for contacting said annular portion, continuously provided either on the inner surface of the female mold or on the outer surface of the male mold, said ridge having a height of 50–90% of the clearance spacing between said molds to thereby bond said apertured article and said flat bottom plate together and make the wall thickness thereof uniform,

pressing the lip portion of a resulting receptacle vertically by means of a rib-forming member to reduce the volume thereof to form a rib, and

removing the resulting receptacle after cooling the molds.

4,113,825

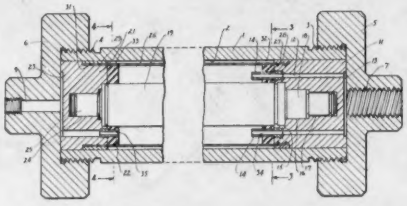
METHOD OF SEALING THE ENDS OF AN ELASTOMERIC ROLL

Robert W. Hill, Sussex; William G. Onnen, Newton, and Lyle C. Ryder, Rockaway, all of N.J., assignors to Ames Rubber Corporation, Hamburg, N.J.

Continuation of Ser. No. 591,720, Jun. 30, 1975, abandoned. This application Sep. 12, 1976, Ser. No. 719,696

Int. Cl.[2] B29D *3/02*; B29G *7/00*

U.S. Cl. 264—262 **6 Claims**



1. The method of sealing the ends of an elastomeric roll having a cylindrical metal core and a flexible outside tubular sleeve of protective material spaced therefrom, which comprises mechanically securing each end of said sleeve to an apertured roll and sleeve support member, each said support member having disposed thereagainst a preformed annular sealing ring to extend between said core and said flexible sleeve, and each said ring being made of deformable curable elastomeric fluorosilicone material, placing said support members, said sleeve and said core within a cylindrical mold having an inside diameter greater than the outside diameter of said sleeve, injecting uncured elastomeric silicone material under pressure through an aperture in said at least one sealing ring and into the space between said sleeve and said core, compressing said sleeve into contact with the cylindrical mold wall and concurrently deforming and expanding said rings and bonding their cylindrical surfaces to opposed cylindrical surfaces of the sleeve and metal core, and thereafter curing said elastomeric materials before removal of the cured sleeved roll from the cylindrical mold.

4,113,826

FLUID FLOW CONTROL VALVES

Alan Philip Jones, Cwmbran Gwent, Wales, assignor to Saunders Valve Company Limited, Gwent, Wales

Filed Jan. 24, 1977, Ser. No. 761,900

Claims priority, application United Kingdom, Feb. 25, 1976, 7504/76

Int. Cl.[2] B29F *1/00*

U.S. Cl. 264—269 **6 Claims**

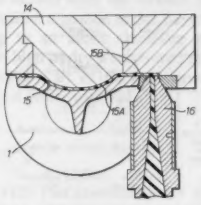
1. A method of forming an injection moulded lining on a valve body, said valve body having a flow passage and a pair of end flanges, said method comprising:

(1) assembling the valve body with mould members to define a cavity, the cavity comprising:

(a) a desired lining portion which when filled with in-

jected material defines a desired lining extending over the entire surface of said flow passage and over at least part of the surface of each said end flange; and

(b) an extension portion continuous with the desired lining portion and extending outwardly from an edge of the desired lining portion, the extension portion when filled



with injected material forming a tab which extends from and is integral with the desired lining;

(2) injecting a lining material into the extension portion of the cavity until the cavity is filled with lining material; and

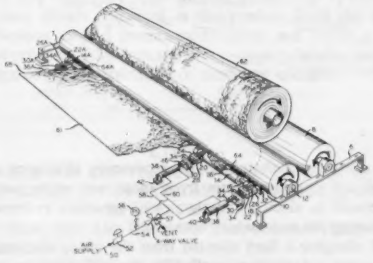
(3) stripping the valve body complete with the desired lining and the tab from the mould members whilst maintaining the tab integral with the desired lining.

4,113,827

METHOD AND APPARATUS USEFUL IN CONTROL OF EDGE UNIFORMITY IN NONWOVEN FABRICS

Frederick L. Stoller, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 15, 1976, Ser. No. 723,394
Int. Cl.[2] B29C *15/00*
U.S. Cl. 264—280 **8 Claims**



1. A method comprising:

passing a nonwoven fabric to a compression zone, said fabric being produced from staple fibers and having two edge portions and a middle portion wherein the edge portions are thicker portions of said fabric as compared to said middle portion, and

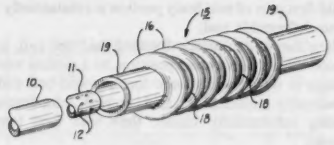
compressing only the thicker portions in the compression zone to reduce the thickness of said thicker portions approximately to the thickness of said middle portion so that a nonwoven fabric with a uniform thickness is produced.

4,113,828

METHOD FOR MAKING FLEXIBLE CORRUGATED RUBBER TUBING AND TUBING PRODUCED THEREBY

Vance M. Kramer, Sr., 402 E. Boundry Rd., Perrysburg, Ohio 43551, and Vance M. Kramer, Jr., 1913 Greendale Ave., Findlay, Ohio 45840

Division of Ser. No. 676,281, Apr. 12, 1976, Pat. No. 4,053,275.
This application Aug. 11, 1977, Ser. No. 823,837
Int. Cl.[2] B29D *23/00*; B29H *7/14*
U.S. Cl. 264—294 **9 Claims**



1. A method for making flexible corrugated tubing from a sleeve of uncured rubber including the steps of:

positioning said sleeve on a forming mandrel,

forming a length of corrugated, flexible and extensible tubing;

positioning said length over said sleeve;

expanding said sleeve radially into engagement with interior surfaces of said length of corrugated flexible and extensible tubing to form at least rudimentary corrugations in said sleeve,

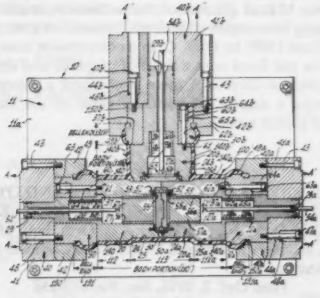
removing said length of corrugated, flexible and extensible tubing and said sleeve from said mandrel and said sleeve from said length of flexible and extensible tubing and placing said sleeve on a curing mandrel in an axially foreshortened corrugated condition for heat treating in an oven to set said corrugations.

4,113,829

METHOD OF FORMING A BELL END ON THERMOPLASTIC PIPE

Donald R. Bowker, Cerritos; Donald J. Klein, Downey, and Stephen E. Rados, Norwalk, all of Calif., assignors to Philips Industries Inc., Dayton, Ohio

Filed Feb. 9, 1976, Ser. No. 656,538
Int. Cl.[2] B29F *1/00*; B29C *5/00*; B29D *23/00*
U.S. Cl. 264—295 **29 Claims**



1. A method for forming a hollow thermoplastic article, having an enlarged bell end with an inner annular groove therein, and a body portion having at least a longitudinal section thereof of smaller inner diameter than the diameter of said inner annular groove of said bell end, which comprises the steps of:

introducing molten plastic into a hollow article forming mold means including a cavity means and core means which cavity and core means together, in closed position, define said bell end and said body portion, said core means being movable, with respect to said cavity means, from a closed position to at least one partially retracted position and thence to a fully retracted position clear of said cavity means and said cavity means being openable to enable said article to be ejected from said cavity means;

cooling the molten plastic of at least a first part of said body portion, while said mold means is in closed position, to a first temperature range within which said plastic forming said first part of said body portion is substantially rigid and non-deformable and,

cooling the molten plastic forming said bell end, while said mold means is in closed position, to a second temperature range in which said plastic forming said bell end remains resiliently deformable, said second temperature range being substantially higher than said first temperature range;

in sequence, partially retracting said core means to thereby remove said core means defining said bell end with some elastic deformation of said bell end while the plastic forming said bell end lies within said second higher temperature range and is still readily deformable and said first part of said body portion lies within said first lower temperature range and then, fully retracting said core means; and

ejecting said formed thermoplastic article from said cavity means before said bell end has cooled to a substantially rigid condition to allow said bell end to recover to its undeformed shape.

4,113,830
METHOD OF FABRICATING SILICON NITRIDE BODIES

Khodabakhsh S. Mazdiyasni, Xenia, and Charles M. Cooke, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 18, 1974, Ser. No. 452,038
Int. Cl.[2] C04B *35/58*
U.S. Cl. 264—101 **10 Claims**

1. A method for fabricating a silicon nitride body which comprises compressing under a vacuum or in an inert atmosphere a mixture of (1) a silicon compound selected from the group consisting of alpha silicon nitride, amorphous silicon nitride and polymeric silicon diimide powders and (2) 0.5 to 10 weight percent, based on the weight of the silicon compound, of a sintering aid in finely divided form selected from the group consisting of compounds having the formulas M_2O_3, MH_3 and MN, where M is an element of the lanthanide series at a pressure ranging from about 4000 to 6000 psi and at a temperature ranging from 1600° to 1750° C. in a compression zone formed of graphite and lined with a sheet of graphite; and continuing the compression step until there is obtained a silicon nitride body having a density substantially equal to the theoretical density of silicon nitride.

4,113,831
RECOVERY OF SODIUM FLUORIDE AND OTHER CHEMICALS FROM SPENT CARBON LINERS

George Otto Orth, Jr., and Richard D. Orth, both of Seattle, Wash., assignors to National Fluoride and Chemical Corporation, Seattle, Wash.

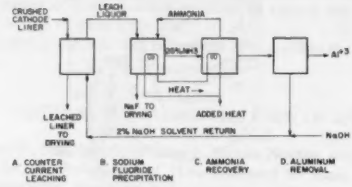
Filed Oct. 2, 1975, Ser. No. 618,958
Int. Cl.[2] C01F *7/04*
U.S. Cl. 423—119 **7 Claims**

1. A method for recovering the fluoride and aluminum contained in used cathode carbon liner from electrolytic cells used in the refining of aluminum, comprising:

extracting crushed liner material containing fluoride and aluminum with a caustic solution in an extraction zone to yield an extraction solution containing solubilized sodium aluminate and sodium fluoride,

adding a solubility suppressant to the extraction solution containing the sodium fluoride which suppresses the solubility of the fluoride and causes precipitation of sodium fluoride,

recovering the sodium fluoride from the extraction solution,



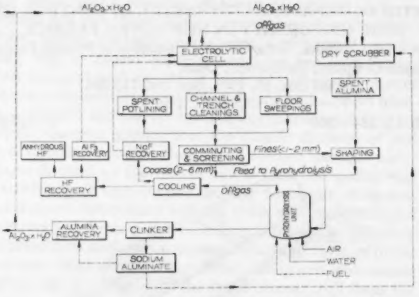
contacting the remaining extraction solution containing the sodium aluminate with carbon dioxide to precipitate the aluminum as aluminum hydrates, leaving a residual solution containing sodium carbonate, and

regenerating the caustic solution from the residual solution for recycle to the extraction zone by adding calcium hydroxide to the residual solution.

4,113,832
PROCESS FOR THE UTILIZATION OF WASTE MATERIALS FROM ELECTROLYTIC ALUMINUM REDUCTION SYSTEMS

Norman Bell, Livermore; John N. Andersen, Moraga, and Hung-Kei H. Lam, Walnut Creek, Ala.L OF CA, assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Nov. 28, 1977, Ser. No. 855,506
Int. Cl.[2] C01F *7/04*; C01B *7/19*
U.S. Cl. 423—119 **15 Claims**



1. An integrated process for recovering aluminum, alkali metal and fluoridic values from spent and waste materials generated in electrolytic aluminum reduction systems and containing the same which comprises:

(a) charging a feed selected from the group consisting of spent carbonaceous potlinings, channel cleanings, trench cleanings, floor sweepings, spent alumina scavenger from dry scrubbers employed for purifying aluminum reduction cell offgases, and mixtures thereof, into a furnace;

(b) subjecting the charge in the furnace to a thermal treatment at a temperature within the range of about 1100° and 1350° C. in the presence of sufficient water to provide pyrohydrolysis conditions resulting in the generation of an offgas containing volatilized fluorine values in the form of alkali fluorides and HF with the simultaneous production of a residual clinker being essentially free of volatiliz-

able fluorine values, and containing alumina and Na_2O values;

(c) removing and cooling of the offgas to obtain the alkali fluorides in solid form, which are separated from the residual offgas stream;

(d) recovering HF from the residual, essentially alkali fluoride-free offgas;

(e) discharging the clinker from the furnace and subjecting the clinker to alkaline digestion under Bayer process conditions resulting in an alkali aluminate solution from which alumina in high purity is recovered and in a residue containing essentially all of the undesirable impurities from the spent and waste materials.

4,113,833

PROCESS FOR THE PRODUCTION OF ALUMINA FROM THE MINERAL COMPONENT OF SOLID FUELS

Nikolai Ivanovich Eremin, prospekt Elizarova, 20, kv. 28, Leningrad; Semen Alexandrovich Tager, ulitsa Dmitria Ulyanova, 4, korpus 2, kv. 361, Moscow; Vladimir Nikolaevich Kostin, Savvinskaya naberezhnaya, 3, kv. 82, Moscow; Lev Nikolaevich Bobkov, Serpukhovsky val, 5, kv. 152, Moscow; Mikhail Ivanovich Zaitsev, Meierovsky proezd, 30, kv. 11, Moscow; Nikolai Andreevich Kaluzhsky, Vasilievsky Ostrov, Sredny prospekt, 6/13, kv. 123; Nikolai Stepanovich Shmorgunenko, Vasilievsky Ostrov, 1 Linia, 28, kv. 15, both of Leningrad; Abram Zinovievich Jurovsky, ploschad Vosstania, 1, kv. 276, Moscow; Viktor Mikhailovich Kozlov, Gavanskaya ulitsa, 10, kv. 29, Leningrad; Fritiof Meerovich Yakhilevich, Krasnoarmeiskaya ulitsa, 21, kv. 181, Moscow; Mikhail Yakovlevich Shpirt, Teply Stan, 1 mikroraion, korpus 11, kv. 84, Moscow, and Vladlen Iosifovich Panin, Leninsky prospekt, 21, kv. 2, Moscow, all of U.S.S.R.

Filed Jul. 2, 1976, Ser. No. 702,208

Int. Cl.² C01F *7/18*

U.S. Cl. 423—131 **3 Claims**

1. A process for the production of alumina directly from solid fuels containing aluminum, silicon and iron oxides during the burning of said fuels, comprising mixing the solid fuel with limestone with the following molar ratios of limestone and said oxides: $CaO:SiO_2 = 2.0$, $CaO:Al_2O_3 = 1.3–1.8$, $CaO:Fe_2O_3 = 1.0$; burning the resultant mixture at about 1700°–1900° C to obtain a product containing calcium compounds $2CaO.SiO_2$, $12CaO.7Al_2O_3$, $CaO.Al_2O_3$, $CaO.Fe_2O_3$ in the form of a melt; cooling the resultant melt to 1300° C at a rate of about 6° C per minute, and from 1300° C to ambient temperature to convert dicalcium silicate contained in the product from the beta-modification to the gamma-modification and leaching the cooled product with a soda solution to extract alumina, leaving a sludge consisting essentially of dicalcium silicates.

4,113,834

PROCESS FOR CONVERTING WASTE DEAD-BURNED MAGNESIUM OXIDE-CONTAINING MATERIAL INTO USEFUL PRODUCT

Roger Show, 2206 Aldo Blvd., 62301, and Robert Webb, both of Quincy, Ill.

Filed Feb. 1, 1977, Ser. No. 764,551

Int. Cl.² C01F *5/02*

U.S. Cl. 423—155 **8 Claims**

6. A method for treating particles containing dead-burned magnesium oxide having essentially no activity which comprises:

calcining the said particles at a temperature of from about 1000° to about 2000° F for a time of from about 15 to about 60 minutes, the resulting magnesium oxide having an activity which is greater than that of the uncalcined material.

4,113,835

PROCESS FOR PREPARING PURE SYNTHETIC CALCIUM SULFATE SEMIHYDRATE

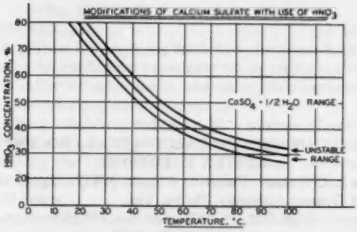
Hans-Friedrich Kurandt, Lüneberg, and Dietrich Schliephake, Gladbeck, both of Germany, assignors to Veba-Chemie Aktiengesellschaft, Gelsenkirchen-Buer, Germany

Continuation of Ser. No. 374,614, Jun. 28, 1973, abandoned. This application Nov. 10, 1976, Ser. No. 740,469

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1972, 2233189

Int. Cl.² C01F *11/46*

U.S. Cl. 423—170 **5 Claims**



1. A process for the preparation of refined synthetic calcium sulfate semihydrate from impure phosphate containing wet gypsum which consists essentially of:

A. Dispersing said impure wet phosphate containing gypsum in a liquid phase containing nitric acid and stirring the resultant dispersion while maintaining the same at a temperature of 22°–100° C. while employing nitric acid in a concentration between 30 and 80 weight percent HNO_3;

B. One of said reaction conditions of temperature or nitric acid concentration being fixed in said ranges, the other being selected within the stability range of calcium sulfate semihydrate which is determined by the area located below the straight line defined by the equation:

$$100/c = 0.02853\ t + 0.7004$$

wherein c is the concentration of nitric acid in weight percent and t is the temperature in ° C, and bounded by the axis of the abscissa $100/c$ in a $(t/100/c)$ diagram with integration between the $100/c$ values corresponding to said concentrations ($100/30 = 3.33$ and $100/80 = 1.25$) and excluding the range of values for $t<22°$ and for $t<100°$ C;

C. If carrying out the process at a fixed temperature, adjusting the nitric acid concentration C_{pr} for the purification and recrystallization liquid according to the equations:

$$100/c = 0.02853\ t + 0.7004$$

$$C_{pr} = c + \Delta c \text{ weight percent } HNO_3,$$

and

$$5 \leqq \Delta c < 20 \text{ weight percent } HNO_3;$$

D. If starting from a liquid in which the nitric acic concentration C is fixed, adjusting the temperature of the acidulation mixture to a temperature t_{pr} according to the equations:

$$t = 35.05\,\frac{100}{c} - 24.55°\ C \qquad \text{(Equation A)}$$

$$t_{pr} = t + \Delta t°\ C \qquad \text{(Eq. B)}$$

and

$$5 \leqq \Delta t < 20°\ C$$

thereby dissolving most of the phosphate impurities in said impure gypsum;

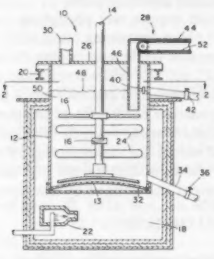
E. Recrystallizing the gypsum as calcium sulfate semihydrate, separating the recrystallized product from the liquid phase, and washing the recrystallized separated product in counter-flow with water and recovering calcium sulfate semihydrate.

4,113,836

CONTINUOUS GYPSUM CALCINATION PROCESS AND KETTLE THEREFOR

Francis J. O'Connor, Rockville Center, N.Y., assignor to National Gypsum Company, Dallas, Tex.

Filed Oct. 29, 1976, Ser. No. 737,152
Int. Cl.² C04B *11/02*
U.S. Cl. 423—171 **9 Claims**



1. Apparatus for continuously calcining finely ground gypsum comprising a gypsum calcining kettle, means for heating material in said kettle, inlet means for continuously feeding said gypsum to said kettle, and an overflow discharge opening directly from the interior through the sidewall of said kettle in the upper half thereof, said inlet means for continuously feeding said gypsum having an enclosed chute extending downwardly into said kettle and having a lowermost extent nearer the overflow discharge opening than the bottom of said kettle, with the chute having a cross-sectional area of about 1% of the total cross-sectional area of said kettle at the surface of said mass of gypsum and with the chute opening being completely below the bottom of said overflow discharge opening.

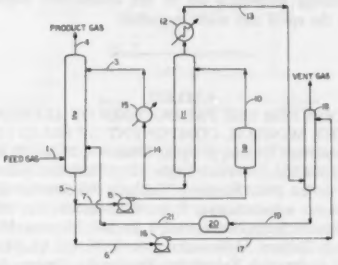
6. The process of calcining gypsum which comprises heating a mass of finely ground gypsum in a kettle to a temperature sufficient to convert said gypsum to calcium sulfate hemihydrate, maintaining a substantially continuous supply of gypsum being fed to said kettle, allowing a substantially continuous flow of calcined gypsum at the top of said mass to discharge, through an overflow outlet, from said kettle, whereby a substantially constant depth of calcining gypsum is maintained within said kettle, said supply of gypsum to said kettle being fed through an enclosed chute which extends through the kettle top and down into a zone within said mass of gypsum nearer to the top than the bottom thereof but opening completely below the top surface of said gypsum mass, said chute having a cross-sectional area of about 1% of the total cross-sectional area of said kettle at the surface of said mass of gypsum.

4,113,837

PROCESS FOR SEPARATING POLYMERIC CONTAMINANTS FROM AQUEOUS ABSORBENT SOLUTIONS USED TO TREAT ORGANIC GAS-CONTAINING GAS STREAMS

John Edward Kendall, Charleston, W. Va., and Kenneth Francis Butwell, Newburgh, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,542
Int. Cl.² B01D *53/34*
U.S. Cl. 423—226 **26 Claims**



2. In a process for removing acid gas from hydrocarbon-containing feed gas containing it and a polymerizable component wherein (a) said feed gas is contacted in an absorbing zone with an aqueous absorbent solution containing as an absorbent an alkanolamine, an alkali metal carbonate, an alkali metal aminoalkanoate, ammonium carbonate or ammonium hydroxide to remove acid gas from said feed gas and form a mainstream of rich aqueous absorbent solution enriched in acid gas removed from the feed gas, (b) said rich aqueous absorbent solution is moved to a stripping zone where the acid gas contained therein is removed to form a lean aqueous absorbent solution depleted in acid gas content, and (c) said lean aqueous absorbent solution is recycled and re-contacted with succeeding feed gas containing acid gas and said polymerizable component, the improvement of removing polymer which accumulates in said aqueous absorbent solution due to the presence of said polymerizable component, comprising, (1) adjusting the pH of said rich aqueous absorbent solution into the range of about 6.0 to about 8.5 and (2) removing said polymer from said rich aqueous absorbent solution having a pH of about 6.0 to about 8.5.

4,113,838

METHOD OF TREATING COMBUSTION EXHAUST GAS CONTAINING NITROGEN OXIDES

Sakae Koike; Shoichi Matsunami; Yorinobu Goto, and Yoshio Tanabe, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Dec. 30, 1976, Ser. No. 755,936
Int. Cl.² C01B *21/00*; B01D *53/34*
U.S. Cl. 423—235 **4 Claims**

1. A method of removing nitrogen oxides from a combustion exhaust gas containing nitrogen oxides which comprises:

a first step of reducing nitrogen oxides by treating a mixture of the exhaust gas, oxygen and ammonia in the absence of hydrogen or in the presence of hydrogen, wherein the mole ration of hydrogen to ammonia is less than 10, at a temperature from 700° C. to 1300° C. and a second step of adding hydrogen to said treated exhaust gas at a point wherein the temperature of said exhaust gas is 550° C. to 680° C. in an amount sufficient to yield a mole ratio of hydrogen to ammonia in the exhaust gas of from 10 to 50 and maintaining a residence time of from 0.2 to 10 seconds in said second step.

4,113,839

NITROGEN OXIDES REMOVAL METHOD

Masao Maki, Nabari; Yasunori Kaneko, Ando; Kunihiro Tsuruda, Yamatokoriyama, and Ikuo Kobayashi, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 27, 1977, Ser. No. 846,495
Claims priority, application Japan, Oct. 29, 1976, 51-130753
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—239 10 Claims

1. A method of removing nitrogen oxides from a gas which comprises contacting a gas containing nitrogen oxides therein with a formed substance at temperatures between 10° C. and 100° C., said formed substance comprising an alkali material in an amount sufficient to react with and remove the nitrogen oxides from the gas, an active carbon in the range of 2.5 to 30% by weight, a cement material in amounts sufficient to cement the various components together and a binding amount of a high molecular weight binder material selected from the group consisting of carboxymethyl cellulose, methyl cellulose, sodium alignate, starch, polyvinyl alcohol, polyester acrylate, molasses, and gelatin.

4,113,840

PROCESS FOR THE REMOVAL OF SULFUR DIOXIDE FROM EXHAUST FLUE GASES

John E. Hanway, Jr., Naperville, Ill., and Richard G. Mumford, San Francisco, Calif., assignors to Beamer/Wilkinson & Associates, Oakland, Calif.

Filed Sep. 19, 1974, Ser. No. 507,290
Int. Cl.[2] C01B *13/00, 17/72*
U.S. Cl. 423—242 16 Claims

1. A method for removing sulfur dioxide from exhaust gas containing the same, comprising the steps of

(a) conveying the exhaust gas and an aqueous slurry of particulate adsorbent for sulfur dioxide selected from the group consisting of natural or artificial zeolite activated carbon and coal char in the same general direction through a slurry contacting zone comprising a venturi contact zone of substantially reduced diameter in comparison to the exhaust gas flow path and accelerating the velocity of the entering mixture to a sufficient extent to break up the liquid portion of the slurry into fine droplets to promote intimate contact between the adsorbent and exhaust gas to remove sulfur dioxide from the exhaust gas by adsorption onto the adsorbent,

(b) reforming a slurry from the adsorbent and liquid droplets from step (a) and conveying the same to an oxidation zone, contacting the sulfur dioxide adsorbed adsorbent therein with oxygen for sufficient time to convert the adsorbed sulfur dioxide to sulfur trioxide, and desorbing the sulfur trioxide from the adsorbent in the oxidation zone by reaction with the slurry water to form a sulfuric acid solution, and

(c) separating at least some of the formed sulfuric acid solution from the slurry of step (b) and recycling desorbed adsorbent slurry to said contacting zone.

4,113,841

STABILIZED RED PHOSPHORUS AND PROCESS FOR MAKING IT

Horst Staendeke; Franz-Josef Dany; Joachim Kandler; Theodor Auel, and Werner Kloss, all of Erftstadt, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 13, 1977, Ser. No. 815,160
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1976, 2632296
Int. Cl.[2] C01B *25/00;* C01C *25/00;* C01D *25/00;* C01F *25/00*
U.S. Cl. 423—265 16 Claims

1. Pulverulent red phosphorus comprising a homogeneous blend of red phosphorus particles with a size of at most about 2 mm and the aluminum, magnesium, calcium or zinc salt of an alkyl-, cycloalkyl-, aryl- or aralkylphosphonic acid having 1 to 20 carbon atoms, the salt being present in the homogeneous blend in a proportion of about 0.5 to 5 weight %.

4,113,842

PREPARATION OF DICALCIUM PHOSPHATE FROM PHOSPHATE ROCK BY THE USE OF SULFUR DIOXIDE, WATER, AND CARBONYL COMPOUNDS

John F. McCullough; John F. Phillips, Jr., and Leslie R. Tate, all of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 730,210, Oct. 6, 1976, now Defensive Publication No. T962,001. This application Mar. 18, 1977, Ser. No. 779,038
Int. Cl.[2] C01B *15/16, 25/26;* C01F *1/00*
U.S. Cl. 423—308 14 Claims

1. A process for preparing dicalcium phosphate from beneficiated or unbeneficiated phosphate ore or mixtures thereof by use of sulfur dioxide, water, and an organic carbonyl compound, which comprises the steps of:

1. mixing said phosphate ore with a mixture of sulfur dioxide, water, and organic carbonyl compound while maintaining the temperature of the resulting reaction slurry below 50° C. for a period of time from about 0.5 to about 10 hours;
2. separating the solids from the liquid in said reaction slurry from step **1** supra;
3. washing said solids from step **2** supra with a wash mixture comprising sulfur dioxide, water, and organic carbonyl compound, said organic carbonyl compound selected from the group consisting of aldehydes, methyl alkyl ketones, cycloketones, and mixtures thereof to recover phosphate values;
4. recycling phosphate containing wash effluent from step **3** supra to step **1** supra;
5. heating washed solids from step **3** supra to recover organic carbonyl compound and sulfur dioxide;
6. recycling recovered organic carbonyl compound and sulfur dioxide from step **5** supra to step **1**, supra;
7. distilling sulfur dioxide from the liquid separated from said reaction slurry in step **2** supra to precipitate dicalcium phosphate;
8. separating said dicalcium phosphate from liquid as product; and
9. recycling the liquid from step **8** supra to step **1** supra.

4,113,843

PROCESS FOR THE PRODUCTION OF ZEOLITES IN THE FORM OF BINDERLESS SPHERICAL GRANULES

Yakov Volfovich Mirsky, ulitsa Krasnykh frontovikov, 10, kv. 12; Akivy Zinovievich Dorogochinsky, ulitsa Krasnoznamennaya, 8; Nelli Fillipovna Meged, ulitsa Lenina, 42a, kv. 32, and Antonina Pavlovna Kosolapova, ulitsa Lenina, 27, kv. 12, all of Grozny, U.S.S.R.

Continuation of Ser. No. 485,372, Jul. 3, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,651
Int. Cl.[2] C01B *33/28*
U.S. Cl. 423—329 23 Claims

1. A process for the production of binderless spherical granules of from 1 – 6 mm diameter and consisting essentially of type A or faujasite zeolites comprising the following steps:

a. mixing an aqueous solution of alkali metal silicate with a concentration of 100–200 g/l based on SiO_2 and an aqueous solution of alkali metal aluminate with a concentration of 50–100 g/l based on Al_2O_3 to form a sol consisting essentially of water, said silicate and said aluminate, said solutions being used in a ratio such that the molar ratio SiO_2:Al_2O_3 in the sol is from 4 to 10:1;

b. introducing the resulting combined sol in separate flows into an organic liquid immiscible with said sol, whereby said sol is broken into spherical drops which spontaneously change into spherical granules of gel in the medium of said organic liquid;

c. transferring said spherical granules of gel from said organic liquid into an aqueous solution of an ammonium salt in a concentration of 10–100 g/l;
d. successively treating said granules of gel with an aqueous solution of ammonium salt of a concentration of 10–100 g/l and an aqueous solution of aluminium salt of a concentration of 5–30 g/l until said gel is saturated with both ammonium and aluminium cations from said salts, and washing with water;
e. heat treating said washed granules of gel at from 80 to 800° C. to obtain granules of dehydrated amorphous aluminosilicate;
f. crystallizing the granules of dehydrated amorphous aluminosilicate in an alkaline solution of sodium aluminate with a concentration of 10–150 g/l based on Al_2O_3 at 50°–100° C. to obtain spherical granules of type A or faujasite zeolite;
g. washing said spherical granules of said zeolite with water until the pH of the waste washing water is 9–11; and
h. drying the washed granules of zeolite, thus obtaining dried spherical binderless granules of from 1 – 6 mm diameter and consisting essentially of type A or faujasite zeolite.

4,113,844

METHOD OF PRODUCING HIGH-PURITY TRANSPARENT VITREOUS SILICA BODY

Tadashi Tokimoto, Fujisawa; Kazumasa Kawaguchi, Hiratsuka; Junji Izawa, Hiratsuka, and Yoshinobu Hiraishi, Hiratsuka, Japan, assignors to Komatsu Electronci Metals, Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1976, Ser. No. 733,400
Claims priority, application Japan, Nov. 20, 1975, 50-138659
Int. Cl.² C01B *33/12*
U.S. Cl. 423—336 **1 Claim**

1. A method of producing high-purity transparent vitreous silica body by supplying to a burner, monosilane, argon, oxygen and hydrogen gases to form a flame and to effect hydrolysis of said silane within the flame to deposit a high-purity transparent vitreous silica body, said flame comprising a reduction area containing excess hydrogen, said method comprising continuously feeding said gases to said burner to deposit silica onto a growing head of said body while maintaining said head within said reduction area and continually pulling down said body, the width of the reduction area containing excess hydrogen being more than approximately 1.5 times the diameter of said growing head and the length of said reduction area being more than 2.5 times said diameter.

4,113,845

DISPROPORTIONATION OF CHLOROSILANE

Carl J. Litteral, Newport, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 152,587, Jun. 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 9,987, Dec. 17, 1970, abandoned. This application Sep. 20, 1976, Ser. No. 724,919
Int. Cl.² C01B *33/08, 33/04*
U.S. Cl. 423—342 **3 Claims**

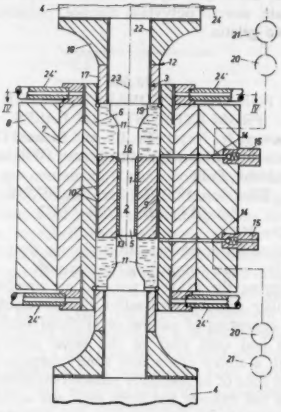
1. The cyclic continuous process for the disporportionation of one or more of trichlorosilane, dichlorosilane and monochlorosilane which comprises continually feeding such chlorosilane to a water-dried fixed bed of a divinylbenzene-styrene copolymer based macroreticulated anion exchange resin containing tertiary amino or quaternary ammonium groups thereof in the chloride ionic form, said groups being bonded to the resin through carbon, which resin is insoluble in silane, monochlorosilane, dichlorosilane, trichlorosilane and silicon tetrachloride, and is maintained at a temperature of between 0.° C. to 350° C. for a period of time whereby there is formed in the bed a silane containing less chlorine than is contained in the chlorosilane fed to the bed and there is also formed a silane containing more chlorine than the chlorosilane fed to the bed, at least a portion of said silanes formed by disproportionation in the bed are removed therefrom and at least a portion thereof are separated each from the other and each is recovered and the chlorosilane feed which is not disproportionated is recycled to the fixed bed.

4,113,846

METHOD OF PRESSURE TREATMENTS OF MATERIALS

Per Arne Sigurdsson, Askloster, Sweden, assignor to Sigurdssons Mek. Verkstad, Askloster, Sweden

Continuation of Ser. No. 504,969, Sep. 11, 1974, abandoned. This application Mar. 17, 1977, Ser. No. 778,565
Int. Cl.² C01B *31/06*
U.S. Cl. 423—446 **1 Claim**



1. The method of treating material in high-pressure chambers by increasing the pressure exerted on said material to a desired pressure level at which the volume of the material is reduced as a result of a reactional or phase conversion process and thereafter maintaining the pressure during the desired pressure phase time, said method comprising the steps of placing the material to be treated in a high-pressure container, surrounding entirely the said high pressure container by a pressure compensating medium, said medium being a liquid and of such a character to maintain its liquid characteristics at the maximum pressure experienced during said treatment, applying a force on the material and on the pressure compensating medium via a stepped piston with its end portion arranged to enter into one end of said pressure container and thereby defining said high-pressure chamber and a second portion of larger diameter than said end portion arranged to fit a cylindrical chamber containing the pressure compensating medium, whereby an increasing force causes an increase of the pressure on the material in the high-pressure chamber and on the medium in the cylindrical chamber, using valve means to regulate the volume of the pressure compensating medium during said increasing of the force as well as during the pressure phase time, applying a constant force on the piston during the pressure phase time and thereby maintaining the constant pressure on the material in the high-pressure chamber also during the phase conversion process by regulation of the volume of said pressure compensating medium, and using the pressure compensating medium surrounding the said high-pressure container as a pressure supporting medium to counteract the pressure created within the high-pressure chamber.

4,113,847

PROCESS FOR PRODUCING CARBON FIBERS

Keitaro Fukushima; Takamaro Kusunose, and Yoshinori Nosaka, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Sep. 1, 1976, Ser. No. 719,504
Claims priority, application Japan, Sep. 1, 1975, 50-106134
Int. Cl.[2] C01B *31/07*
U.S. Cl. 423—447.4 15 Claims

1. A process for producing carbon fibers, which comprises spinning a copolymer containing at least 85 mol % acrylonitrile and a carboxyl group-containing unsaturated monomer into filaments, washing the filaments with water, stretching the washed filaments in water above 80° C. maintained at a pH below 3.5, drying the stretched filaments thermally stabilizing the dried filaments, and carbonizing, or carbonizing and graphitizing, the stabilized filaments.

4,113,848

METHOD OF PRODUCING SOLUTIONS CONTAINING CUPROUS IONS

Alan James Parker; Winfield Earle Waghorne, both of Canberra; Dion Ewing Giles; John Howard Sharp, both of Sydney; Robert Alexander, and David Michael Muir, both of Canberra, all of Australia, assignors to Anumin Pty. Limited, Canberra, Australia

Division of Ser. No. 533,660, Dec. 17, 1974, Pat. No. 3,966,890, which is a division of Ser. No. 237,061, Mar. 22, 1972, Pat. No. 3,865,744. This application May 14, 1976, Ser. No. 686,496
Claims priority, application Australia, Apr. 2, 1971, PA4500; Apr. 2, 1971, PA4501; Apr. 2, 1971, PA4502; Apr. 28, 1971, PA4735; Jun. 4, 1971, PA5110; Sep. 14, 1971, PA6281; Sep. 24, 1971, PA6411; Oct. 20, 1971, PA6718; Oct. 26, 1971, PA6798; Dec. 14, 1971, PA7383; Jan. 26, 1972, PA7776
The portion of the term of this patent subsequent to Jun. 29, 1993, has been disclaimed.
Int. Cl.[2] C01G *3/10*; C22B *15/00, 15/08*
U.S. Cl. 423—512 A 4 Claims

1. A method of reducing an aqueous cupric sulfate solution or an aqueous cupric ammonium complex salt solution to a solution containing cuprous sulfite, cuprous bisulfite or mixtures thereof comprising mixing said aqueous cupric sulfate solution or said aqueous cupric ammonium complex salt solution with between 8 and 30% by volume acetonitrile or 2-hydroxycyanoethane, adding an alkali metal sulfite or bisulfite and maintaining the pH of the cupric sulfate solution or cupric ammonium complex salt solution between 2 and 6 until a solution containing cuprous sulfite, cuprous bisulfite or mixtures thereof is formed.

4,113,849

RECOVERING SULFUR FROM GAS STREAMS CONTAINING HYDROGEN SULFIDE

Gilbert Richard Atwood, Briarcliff Manor, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 25, 1977, Ser. No. 781,206
Int. Cl.[2] C01B *17/00*
U.S. Cl. 423—574 R 2 Claims

1. In a process for the removal of hydrogen sulfide and the recovery of sulfur from a gas stream containing hydrogen sulfide comprising the steps of:

(a) reacting a portion of the hydrogen sulfide of said gas stream with sulfur dioxide in a Claus reactor to produce sulfur, water and a second gas stream containing said sulfur, water and unreacted H_2S and SO_2;

(b) condensing sulfur from said second gas stream;

(c) thereafter oxidizing the unreacted hydrogen sulfide in said second gas stream to sulfur dioxide and water thereby forming a tail gas stream containing said sulfur dioxide;

(d) contacting said tail gas stream with a mainstream of an aqueous absorbent solution to remove sulfur dioxide from said tail gas stream and form a rich aqueous absorbent solution enriched in sulfur dioxide removed from said tail gas stream;

(e) moving a mainstream of said rich aqueous absorbent solution to a stripping zone where sulfur dioxide is removed to form a lean aqueous absorbent solution depleted in sulfur dioxide content;

(f) recirculating the sulfur dioxide removed in step (e) to step (a) for reaction with hydrogen sulfide; and

(g) recycling a mainstream of said lean aqueous absorbent solution from the stripping zone of step (e) to step (d) for re-contact with said tail gas stream; the improvement comprising

(1) carrying out the reaction of step (a) in only one Claus reactor;

(2) using an aqueous alkanolamine solution as the absorbent solution in step (d);

(3) performing the stripping of step (e) so that the residence time of the liquid alkanolamine solution in said stripping zone is from about 3 to 30 minutes and said stripping zone is operated at a reduced pressure of about 50 to about 350 mm. Hg. and a temperature of about 80° to 100° C. to thereby minimize the formation of sulfate, thiosulfate and thionate anions;

(4) separating from said mainstream of lean aqueous alkanolamine a portion of said aqueous alkanolamine solution containing said sulfate, thiosulfate and thionate anions;

(5) contacting said separated portion with an anion exchange resin having anions displaceable by said sulfate, thiosulfate and thionate anions to remove same from said portion whereby the anions of the resin are replaced by said sulfate, thiosulfate and thionate anions;

(6) returning said portion after contact with said anion exchange resin to one of said mainstreams; and

(7) regenerating said anion exchange resin by contacting it with an aqueous alkaline inorganic hydroxide to replace the sulfate, thiosulfate and thionate anions on said resin with hydroxyl anions thereby forming a waste stream containing said sulfate, thiosulfate and thionate anions.

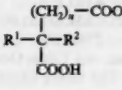
4,113,850

COMPOSITION FOR THE DIAGNOSTIC VISUALIZATION OF NEOPLASTIC TISSUES

Ivan Benes, Greifensee, Switzerland, assignor to Solco Basel AG, Basel, Switzerland

Filed Apr. 29, 1975, Ser. No. 572,701
Claims priority, application Switzerland, Apr. 30, 1974, 5885/74
Int. Cl.[2] A61K *29/00, 43/00*
U.S. Cl. 424—1 8 Claims

1. A process for producing a composition for the diagnostic visualization of neoplastic tissues, namely tumors and metastases, by means of tissue scintigraphy, consisting essentially of an injectable complex of ^{99m}Technetium with a member selected from the group consisting of a dicarboxylic or tricarboxylic acid of the general formula:



in which n is 1 or 2, R^1 and R^2 taken together are an oxo group or the >CH—COOH group or R^1 is a hydrogen atom or a hydroxyl or amino group and R^2 is a hydrogen atom or one of the following groups:

—CH_2—COOH; —CHOH—COOH; —CO—COOH

and a water-soluble salt of the same, in a sterile aqueous solution having a physiologically harmless pH value, said process consisting essentially of the steps of introducing an aqueous solution of a member selected from the group consisting of a dicarboxylic acid or tricarboxylic acid of the above formula

and a water-soluble salt of the same into ampoules, rubber-capped serum vials, carpoules or disposable syringes, removing the solvent subsequently from the solution, reacting the intermediate product obtained which is in solid, stable form immediately before its use for diagnostic purposes with an aqueous solution containing the desired radioactivity dose of a ^{99m}Technetium salt, oxygen being excluded, said injectable complex being produced such that it is in a sterile state.

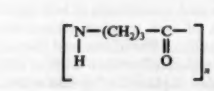
4,113,851

MICROBIOCIDAL COMPOSITION AND ARTICLES PREPARED THEREFROM

Harry H. Leveen, 800 Poly Pl., Brooklyn, N.Y. 11209, and Patrick J. Joyce, 103 Hubbard Ave., Stamford, Conn. 06905

Filed Apr. 15, 1976, Ser. No. 677,135
Int. Cl.[2] A61F *13/00*; A61K *33/18*
U.S. Cl. 424—28 **5 Claims**

1. A composition having prolonged microbiocidal activity containing free iodine and comprising a complex of polymeric polypyrrolidone of the structure:



having a molecular weight of from 1,000 to 500,000 and wherein *n* is large enough to give a polymer having an inherent viscosity of at least 0.2 deciliters per gram with a microbiocidal amount of elemental iodine and 5 to 50 percent by weight of a high molecular weight acidic activity extender having a molecular weight in excess of 10,000 up to 300,000 gram molecular weight units.

4,113,852

ANTIPERSPIRANT COMPOSITION

Divaker B. Kenkare, South Plainfield, and Durland K. Shumway, Piscataway, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,561
The portion of the term of this patent subsequent to Aug. 22, 1995, has been disclaimed.
Int. Cl.[2] A61K *7/38*
U.S. Cl. 424—46 **7 Claims**

1. An antiperspirant composition prepared by co-spray drying an aqueous solution of a mixture of about 78% to about 92% by weight aluminum chlorhydrate, about 6% to about 12% aluminum chloride and about 1% to about 10% urea.

4,113,853

HAPTOGLOBIN INSOLUBILIZED BY BEING FIXED IN FIBRIN

Satoshi Funakoshi, Katano, and Takao Oomura, Toyonaka, both of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Jul. 6, 1977, Ser. No. 813,419
Claims priority, application Japan, Aug. 27, 1976, 51-102763
Int. Cl.[2] A61K *31/74, 35/14, 37/04*
U.S. Cl. 424—78 **28 Claims**

1. An insolubilized haptoglobin comprising fibrin and active haptoglobin insolubilized by being fixed in said fibrin, said fixing being effected by interlinking through an interposed bifunctional compound.

10. A method for preparing insolubilized haptoglobin, which comprises allowing fibrinogen, haptoglobin, thrombin, and a bifunctional compound to react with one another.

4,113,854

PROPHYLACTIC TREATMENT OF MASTITIS

Jeffrey F. Andrews, Egan; Therese A. Mullin, Minneapolis, and Raymond Senkus, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jan. 10, 1977, Ser. No. 758,342
Int. Cl.[2] A61K *31/78, 31/74*; C08L *5/00*
U.S. Cl. 424—81 **14 Claims**

1. A method for the prophylactic treatment of mastitis comprising dipping the teats of the animal into a composition comprising a polymer latex and a water soluble polymer thickening agent in an aqueous medium, said composition having a thixotropic value of 15 to 1200 dynes/cm^2 and an upper viscosity limit of 10 poise at a shear rate of 250 sec^{-1}; and said composition forming a continuous film on the teat which is durable enough to last from milking to milking and sufficiently water sensitive to be removed by wiping with a water-moistened cloth.

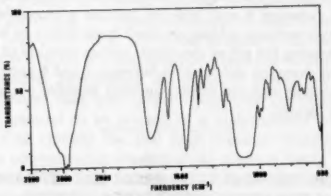
8. A nonirritating composition for the prophylactic treatment of mastitis comprising a polymer latex and a water soluble polymer thickening agent in an aqueous medium, said composition having a thixotropic value of 15 to 1200 dynes/cm^2 and an upper viscosity limit of 10 poise at a shear rate of 250 sec^{-1}; and said composition forming a continuous film on the teat which is durable enough to last from milking to milking and sufficiently water sensitive to be removed by wiping with a water-moistened cloth.

4,113,855

COMPOSITION OF MATTER AND PROCESS

Clarence DeBoer, Kalamazoo; Lester A. Dolak, Plainwell, and Durey H. Peterson, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 19, 1977, Ser. No. 834,285
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—117 **8 Claims**



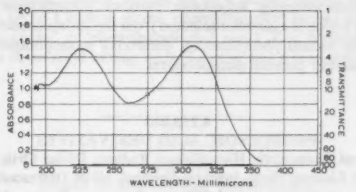
1. An antibacterial composition comprising, in unit dosage form, from about 25 to about 500 mg of antibiotic 354 which in its essentially pure form is characterized as the sulfate salt having the following characteristics:

(a) molecular weight of 172 (field desorption mass. spec.);
(b) has the following elemental analysis: C, 37.08; H, 4.79; N, 12.38; Cl, 15.52; S, 7.48; O, 22.75;
(c) is soluble in water and poorly soluble in methanol, acetone, dimethylsulfoxide and dimethylformamide;
(d) has a characteristic infrared absorption spectrum when dissolved in a mineral oil mull as shown in FIG. 1 of the drawings;
(e) has a characteristic ultraviolet absorption spectrum as shown in FIG. 2 of the drawings; and,
(f) has a characteristic NMR spectrum as shown in FIG. 3 of the drawings, or its pharmacologically acceptable salts as an essentially active ingredient in combination with a pharmaceutical carrier.

4,113,856
ANTIBIOTIC MM 13902

Martin Cole, Dorking; John Dick Hood, Cranleigh, and Dennis Butterworth, Redhill, all of England, assignors to Beecham Group Limited, Great Britain

Continuation-in-part of Ser. No. 559,803, Mar. 19, 1975, abandoned. This application Aug. 24, 1976, Ser. No. 717,334
Claims priority, application United Kingdom, Mar. 28, 1974, 13856/74
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—117 **10 Claims**



1. A pharmaceutically acceptable di-basic salt of MM 13902 which is at least 50% pure wherein MM 13902 is a solid carboxylic acid of the molecular formula $C_{13}H_{16}O_8N_2S_2$ which in the form of a substantially pure sodium salt has the following characteristics:

(a) in aqueous solution, it has a characteristic ultra violet spectrum with absorption maxima at about 305 nm and at about 225 nm substantially as shown in FIG. 1;

(b) when present at 0.4% w/w in a freshly prepared KBr disc, it has a characteristic infra-red spectrum which has absorption maxima at inter alia about 3450, 2950, 1750, 1620, 1510, 1400 and 1260 cm^{-1};

(c) it has a characteristic N.M.R. spectrum when taken in D_2O which spectrum possesses inter alia (i) a pair of low field doublets centered at approximately 2.85τ and 4.00τ with coupling constants of approximately 14 Hz; (ii) a doublet centered at approximately 8.55τ and (iii) a sharp singlet at approximately 8.00τ;

(d) it possesses antibacterial activity against various species including inter alia, strains of *Staphylococcus aureus, Bacillus subtilis, Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Salmonella typhi* and *Pseudomonas aeruginosa;* and

(e) when mixed with ampicillin it synergizes its activity against organisms including strains of *Escherichia coli, Klebsiella aerogenes, Proteus mirabilis, Proteus morganii* and *Staphylococcus aureus Russell.*

4,113,857
PROCESS FOR THE PREPARATION OF IODOPHOR COMPOUNDS AND METHODS FOR STABILIZING IODOPHOR PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Bola Vithal Shetty, Stamford, Conn., assignor to The Purdue Frederick Company, Norwalk, Conn.

Filed May 16, 1977, Ser. No. 797,094
Int. Cl.[2] A61K *33/18*
U.S. Cl. 424—150 **14 Claims**

1. A method of producing an organic iodophor germicidal composition which is substantially free of iodide contamination and therefore non corrosive, which comprises reacting an organic iodophor-forming compound with an iodine adding agent selected from the group consisting of elemental iodine, metallic iodide salts capable of releasing iodide ion, and hydriodic acid in the presence of 0.005–1% by weight of an oxidizing stabilizer selected from the group consisting of iodate ions, bromate ions, chlorite ions, chromate ions, hypochlorite ions, nitrate ions, permanganate ions, persulfate ions, and hydrogen peroxide, whereby iodine adds to said organic iodophor-forming compound to form the corresponding organic iodophor which is free of iodide ions and therefore non-corrosive.

4,113,858
NOVEL COMPOUNDS, COMPOSITIONS AND METHODS OF THEIR USE

George A. Hashim, Irvington, N.Y., assignor to St. Luke's Hospital, New York, N.Y.

Continuation-in-part of Ser. No. 542,175, Jan. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 315,140, Dec. 12, 1972, Pat. No. 3,864,481. This application Jan. 12, 1976, Ser. No. 648,379
Int. Cl.[2] A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 **15 Claims**

1. The method of treating a mammal for the prevention, suppression and diagnosis of multiple sclerosis, which comprises; administering parenterally to said mammal from about 0.0001 to about 25 mg. per kilogram of body weight of a synthetic compound of the formula:

$$H\text{-}(\text{-}A\text{-}B\text{-})_x\text{-}OH$$

wherein x is an integer of at least 0 and A and B each represent a divalent moiety of the formula:

$$\text{-}(R_1)_b\text{-}(R_2)_m\text{-}(R_3)_a\text{-Gln-}R_4\text{-}R_4)_n\text{-}(R_5)_c\text{-}$$

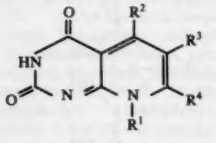
wherein R_1 and R_5 are each selected from the residue of an amino acid and the residue of a polypeptide; R_2 is selected from the residue of tryptophan and tyrosine; R_3 represents the residue of an amino acid; R_4 is selected from the residue of lysine, arginine and histidine; a is an integer of from 0 to 4, inclusive; b and c are each integers of at least 0; m is an integer of from 0 to 1, inclusive; and n is an integer of at least 1; provided that when x is 0 then at least one of R_1 and R_5 is the residue of a polypeptide and when R_1 is the residue of a polypeptide b is 1 and when R_5 is the residue of a polypeptide, c is 1.

4,113,859
CERTAIN PYRIDO-PYRIMIDINES FOR TREATING MAMMALIAN AND AVIAN INFECTIONS

Hamish Christopher Swan Wood, Glasgow, and Thomas Paterson, Larkhall, both of Scotland, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 296,948, Oct. 12, 1972, abandoned. This application Feb. 23, 1973, Ser. No. 335,102
Int. Cl.[2] A61K *31/70*
U.S. Cl. 424—180 **3 Claims**

1. A method of treating an infection in a mammalian or avian host caused by E. coli which utilizes de novo synthesis of riboflavin which comprises the step of administering to a mammalian or avian host having an infection caused by *E. coli* which utilizes de novo synthesis of riboflavin a therapeutically effective treatment dose for said infection of a compound of formula B



(B)

where R^1 is alkyl or hydroxyalkyl having 1 to 6 carbon atoms, and wherein R^2, R^3 and R^4 are the same or different and each is hydrogen or alkyl of 1 to 4 carbon atoms or a pharmaceutically acceptable salt thereof.

4,113,860

O-ALKYL-O-[4-ALKYLPYRIMIDIN(2)yl]-(THIONO)-(THIOL) PHOSPHORIC (PHOSPHONIC) ACID ESTERS AND INSECTICIDAL, ACARICIDAL AND NEMATOCIDAL COMPOSITIONS CONTAINING THEM

Fritz Maurer; Hans-Jochem Riebel, both of Wuppertal; Bernhard Homeyer, Leverkusen; Wolfgang Behrenz, Overath-Steinenbrueck; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

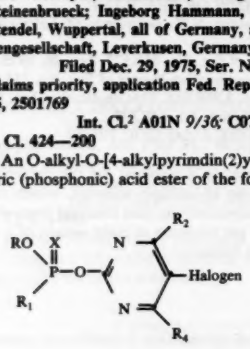
Filed Dec. 29, 1975, Ser. No. 645,128

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1975, 2501769

Int. Cl.[2] A01N *9/36*; C07F *9/65*

U.S. Cl. 424—200 **10 Claims**

1. An O-alkyl-O-[4-alkylpyrimdin(2)yl]-(thiono)-(thiol)phosphoric (phosphonic) acid ester of the formula



(I)

in which

R is alkyl with 1 to 9 carbon atoms,

R_1 is alkyl, alkoxy or alkylmercapto each with 1 to 6 carbon atoms, or phenyl

R_2 is alkyl with 1 to 6 carbon atoms,

R_4 is halogen, thiocyanato or alkoxy, alkylmercapto or alkoxycarbonyl with 1 to 4 carbon atoms in each alkyl radical, and

X is oxygen or sulfur.

8. An insecticidal, acaricidal or nematocidal composition containing as active ingredient an isecticidally, acaricidally or nematocidally effective amount of a compound according to claim 1 in admixture with a diluent.

9. A method of combatting insects, acarids or nematodes which comprises applying to the insects, acarids, or nematodes, or to a habitat thereof, an insecticidally, acaricidally or nematocidally effective amount of a compound according to claim 1.

4,113,861

PHOSPHONATE PHARMACEUTICAL COMPOSITION

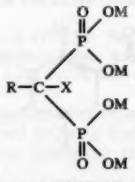
Herbert A. Fleisch, and Rolf Felix, both of Bern, Switzerland, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 2, 1977, Ser. No. 792,946

Int. Cl.[2] A61K *31/66*

U.S. Cl. 424—204 **9 Claims**

1. A process for treating *diabetes mellitus* in humans and lower animals, comprising administering to a human or lower animal in need of such treatment a safe and effective amount of a pharmaceutically-acceptable geminal diphosphonate of the formula



where X is H, OH or NH_2; M is H or a pharmaceutically-acceptable cation or alkyl or aryl moiety; and wherein R is a C_2 to about C_{14} hydrocarbyl group.

4,113,862

CARBOXY PHOSPHONATE PHARMACEUTICAL COMPOSITION

Herbert A. Fleisch, and Rolf Felix, both of Bern, Switzerland, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 2, 1977, Ser. No. 792,947

Int. Cl.[2] A61K *31/66*

U.S. Cl. 424—204 **5 Claims**

1. A process for treating *diabetes mellitus* in humans and lower animals, comprising administering to a human or lower animal in need of such treatment a safe and effective amount of a pharmaceutically acceptable carboxy phosphonate compound which is a member selected from the group consisting of carboxy vicinal phosphonates, dicarboxy monophosphonates and carboxy geminal phosphonates.

4,113,863

PROSTENOIC ACID DERIVATIVES

Manfred Baumgarth; Hans-Eckart Radunz; Dieter Orth; Reinhard Lissner; Hans-Joachim Enenkel, all of Darmstadt, Fed. Rep. of Germany, and Filippus Johannes Zeelen, Heesch, Netherlands, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

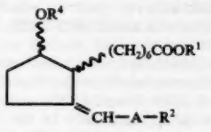
Continuation-in-part of Ser. No. 634,349, Nov. 24, 1975. This application Nov. 5, 1976, Ser. No. 739,142

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1974, 2455976

Int. Cl.[2] C07C *177/00*; A61K *31/19, 31/215*

U.S. Cl. 424—205 **8 Claims**

1. A prostenoic acid compound of the formula



wherein

R^1 is H or alkyl of 1–4 carbon atoms;

R^2 is alkyl of 5–9 carbon atoms;

A is CH_2D or $CH{=}C(OR^5)$;

D is carbonyl or dialkoxypolymethylene of up to 7 carbon atoms;

R^3 is alkanoyl, alkenoyl, alkynoyl, alkylsulfonyl, alkanoyl substituted by fluorine, chlorine or bromine, each of up to 4 carbon atoms, sulfo or the acyl radical of phosphoric acid;

R^4 is H or R^5; and metal or ammonium salts thereof.

4,113,864

PHOSPHOROTHIOLATE PESTICIDAL COMPOSITION

Hiroshi Tsuchiya, Ashiya; Kunio Mukai, Nishinomiya; Akio Kimura, Takarazuka; Hiroshi Taya, Minoo; Keimei Fujimoto, Kyoto; Toshiaki Ozaki; Sigeo Yamamoto, both of Toyonaka; Taizo Ogawa; Tadashi Ooishi, both of Minoo, and Yositosi Okuno, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 415,682, Nov. 14, 1973, Pat. No. 4,028,438, which is a continuation of Ser. No. 8,434, Feb. 3, 1970, abandoned, which is a continuation-in-part of Ser. No. 728,353, May 10, 1968, abandoned. This application Feb. 15, 1977, Ser. No. 768,875

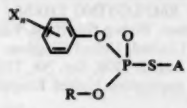
Claims priority, application Japan, May 17, 1967, 42-31645; Sep. 8, 1967, 42-57677; Sep. 11, 1967, 42-58536; Sep. 12, 1967, 42-58859

Int. Cl.[2] A01N *9/00, 9/36*

U.S. Cl. 424—225 **27 Claims**

1. A composition comprising an inert carrier and, as an

active ingredient, an insecticidally or fungicidally effective amount of a phosphorothiolate represented by the formula,



wherein R is an alkyl having up to 5 carbon atoms, A is an alkyl having 3 or 4 carbon atoms, haloalkyl having up to 3 carbon atoms, alkenyl having up to 4 carbon atoms, alkinyl having up to 4 carbon atoms, phenylthioalkyl having up to 9 carbon atoms, or phenylsubstituted etnyl X is hydrogen, a haogen or an alkyl having up to 5 atoms; and *n* is an integer of 1 to 5.

4,113,865

FRUIT JUICE-SUGAR GRANULES

Gilberto Dondi, and Arnaldo Zanotti, both of Milan, Italy, assignors to Bayer Italia Societa per Azioni, Italy

Filed Nov. 22, 1976, Ser. No. 743,853
Claims priority, application Italy, Nov. 28, 1975, 29799 A/75
Int. Cl.[2] A61K *9/46, 31/375, 31/61*
U.S. Cl. 424—230 **10 Claims**

1. Process for the preparation of a pharmaceutical composition comprising granules of citrus fruit juice solids and sugar wherein the granules contain from about 8 to about 12% citrus fruit juice solids with the balance being predominantly sugar and no more than 0.05% water and a hydrolytically unstable pharmaceutical agent which comprises spraying fluidized powdered sugar in a fluidized bed granulator with an unconcentrated citrus fruit juice, granulating and drying the mixture at air temperatures no higher than 90° C., sieving the dried granules to a maximum grain size of 1 mm, redrying the sieved granules until the water content is no more than 0.05% and combining the sieved granules with a hydrolytically unstable pharmaceutical agent.

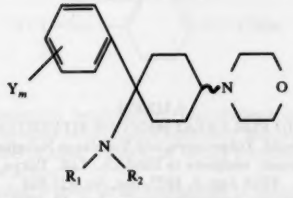
4,113,866

ANALGETIC COMPOUNDS, COMPOSITIONS AND PROCESS OF TREATMENT

Daniel Lednicer, Evansville, Ind., assignor to The Upjohn Company, Kalamazoo, Mich.

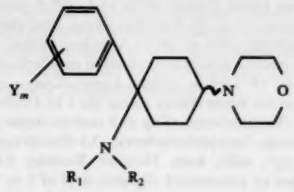
Filed Apr. 1, 1977, Ser. No. 783,806
Int. Cl.[2] C07D *295/12;* A61K *31/535*
U.S. Cl. 424—248.56 **16 Claims**

1. A compound of the formula:



wherein Y is halogen, hydroxy or alkanoyloxy of from 2 to 5 carbon atoms, inclusive; *m* is zero or one; and R_1 and R_2 are alkyl of from 1 to 4 carbon atoms, inclusive.

12. A method for relief of pain comprising the systemic administration to a human or animal of an analgetic amount of a compound of the formula:



wherein Y is halogen, hydroxy or alkanoyloxy of from 2 to 5 carbon atoms, inclusive; *m* is zero or one; and R_1 and R_2 are alkyl of from 1 to 4 carbon atoms, inclusive; or its pharmacologically acceptable acid addition salts.

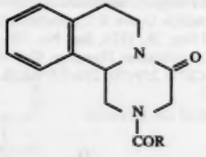
4,113,867

2-ACYL-4-OXO-PYRAZINO-ISOQUINOLINE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Jürgen Seubert, Darmstadt; Herbert Thomas, and Peter Andrews, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 533,467, Dec. 16, 1974, Pat. No. 4,001,411.
This application Nov. 15, 1976, Ser. No. 742,132
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1973, 2362539
Int. Cl.[2] A61K *31/495;* C07D *471/04*
U.S. Cl. 424—250 **10 Claims**

1. An anthelmintically active compound of the formula



and the physiologically acceptable acid addition salts thereof wherein R is selected from the group consisting of pyrryl, thienyl, furyl, indolyl, benzofuryl, benzothienyl, pyridyl, α- or γ-pyranyl, α- or γ-thiopyranyl, quinolyl, isoquinolyl, carbazolyl, pyrazolyl, imidazolyl, benzpyrazolyl, benzimidazolyl, oxazolyl, benzoxazolyl, thiazolyl, benzthiazolyl, isoxazolyl, isothiazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, tetrazolyl, 1,2,3- or 1,2,4-oxadiazolyl, 1,2,4-, 1,3,4- or 2,1,5-thiadiazolyl, 2,1,3-benzothiadiazolyl, acridinyl, pyridazinyl, pyrimidinyl, pyrazinyl, phenazinyl, phenoxazinyl, phenothiazinyl, thianthrenyl, 1,2,5-, 1,2,4- or 1,2,3-triazinyl, 1,2,3,4- or 1,2,4,5-tetrazinyl, purinyl, pyrazolo[3,4-d]pyrimidinyl, pteridinyl, cinnolinyl, phthalazinyl, quinazolinyl, quinoxalinyl, 1,5-naphthyridinyl, nalidixinyl, 1,4-dioxanyl, morpholinyl, pyrrolidinyl, tetrahydrofury tetrahydrothienyl, pyrazolidinyl, imidazolidinyl, 1,2,3,4-tetrahydropyridyl, 1,2,5,6-tetrahydropyridyl, piperidyl, tetrahydropyranyl, 1,2,3,4-tetrahydroquinolyl, 1,2,3,4-tetrahydroisoquinolyl, hexahydropyridazinyl, hexahydropyrimidinyl, piperazinyl, 1,3-dioxanyl pyrrolinyl, dihydrofuryl, pyrazolinyl, imidazolinyl, oxazolidinyl, thiazolinyl, thiazolidinyl, isoxazolidinyl, isothiazolinyl, isothiazolidinyl, 2,3-dihydrobenzthiazolyl, 1,2-dihydroquinolyl, 3,4-dihydroquinolyl, 1,2-dihydroisoquinolyl, 3,4-dihydroisoquinolyl, decahydroquinolyl, decahydroisoquinolyl, chromenyl, chromanyl, dihydropyridazinyl, tetrahydropyridazinyl, dihydropyrimidinyl, tetrahydropyrimidinyl, dihydropyrazinyl, tetrahydropyrazinyl, 1,4-thiazinyl and the corresponding moieties substituted by alkyl of up to 4 carbon atoms, aralkyl

of 7 to 19 carbon atoms, halogen, hydroxy, alkoxy of up to 4 carbon atoms, acyloxy of up to 4 carbon atoms, amino, alkylamino of up to 4 carbon atoms, dialkylamino with alkyl groups each of up to 4 carbon atoms, acylamino wherein acyl is that of a saturated or unsaturated fatty acid of 1 to 18 carbon atoms, lower-alkoxy-acetyl-amino wherein the lower alkoxy group has 1 to 4 carbon atoms, nitro, alkoxycarbonyl of up to 4 carbon atoms in the alkoxy group, benzyloxycarbonyl, 3,5-dimethoxybenzyloxycarbonyl, sulfo, keto, N-oxido, S-oxido, S,S-dioxido, saturated or unsaturated aliphatic acyl of 1 to 18 carbon atoms, alkoxy-acetyl of 1 to 4 carbon atoms in the alkoxy group or acyl from a dicarboxylic acid of 4 to 8 carbon atoms.

3. A pharmaceutical composition consisting essentially of an anthelmintically effective amount per unit dosage of a compound of claim **1** in admixture with a pharmaceutically acceptable carrier.

4,113,868

5,6-DIHYDROPYRIMIDIN-4(3H)ONE DERIVATIVES, AND ANTIEDEMA COMPOSITIONS AND METHODS EMPLOYING THEM

Gabor Bernath; Lajos Gera; György Göndös, all of Szeged; Zoltan Ecsery; Judit Hermann nee Voros, both of Budapest; Matyas Szentivanyi, and Erzsebet Janvari, nee Kanyo, both of Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

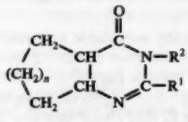
Filed Sep. 29, 1976, Ser. No. 728,459

Claims priority, application Hungary, Oct. 3, 1975, 1614

Int. Cl.[2] **C07D** *239/90, 239/91;* **A61K** *31/505*

U.S. Cl. 424—251 **38 Claims**

1. A compound of the formula:



wherein

(a) R^1 is methyl, cyclohexyl, phenyl, m-tolyl, p-tolyl, p-tert-butylphenyl, m-trifluoromethylphenyl, m-fluorophenyl, p-fluorophenyl, m-chlorophenyl, p-chlorophenyl, m-bromophenyl, p-bromophenyl, o-hydroxyphenyl, p-methoxyphenyl, p-nitrophenyl, benzyl, p-chlorobenzyl, m,p-dimethoxyphenyl, or o-pyridyl, R^2 is hydrogen and *n* is 2; or

(b) R^1 is phenyl, p-tert-butylphenyl, m-chlorophenyl, p-chlorophenyl, p-bromophenyl or p-nitrophenyl; R^2 is hydrogen and *n* is 3; or

(c) R^1 is phenyl or m-chlorophenyl, R^2 is hydrogen and *n* is 1; or

(d) R^1 is methyl, R^2 is p-tolyl or p-ethoxyphenyl, and *n* is 2; or

(e) R^1 is ethyl, R^2 is m-pyridyl or p-tolyl; and *n* is 2; or

(f) R^1 is phenyl, R^2 is methyl, phenyl or p-tolyl and *n* is 2.

37. An antiedema composition which comprises an effective amount of the compound defined in claim **1** with at least one pharmaceutically acceptable inert carrier or diluent.

38. A method of treating edema in animals which comprises the step of orally administering an effective amount of the compound defined in claim **1**.

4,113,869

TETRAHYDROISOQUINOLINE BASIC ETHERS AND PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING THEM

Derek Victor Gardner, Bishop Stortford, England, assignor to Beecham Group Limited, United Kingdom

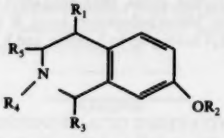
Filed Aug. 2, 1976, Ser. No. 710,446

Claims priority, application United Kingdom, Aug. 9, 1975, 33283/75

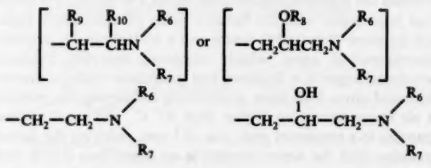
Int. Cl.[2] **C07D** *217/16;* **A61K** *31/47*

U.S. Cl. 424—258 **33 Claims**

1. A compound of the formula (II):



or a pharmaceutically acceptable salt or optically active isomer thereof, wherein R_1 is phenyl or naphthyl, or phenyl or naphthyl each substituted by one or two halogen atoms, trifluoromethyl, C_{1-4} alkyl, hydroxy, C_{1-4} alkoxy, nitro, amino, methylamino, dimethylamino, diethylamino, carboxy, methoxycarbonyl, ethoxycarbonyl, cyano, carboxamido, sulphonamido, trifluoromethoxy, trifluoromethylthio or acyl of 2 to 7 carbon atoms; R_2 is a group:



in which R_6 is a hydrogen or methyl, R_7 is hydrogen or methyl, ethyl or benzyl; R_3 is hydrogen or C_{1-6} alkyl or trifluoromethyl; R_4 is hydrogen or C_{1-6} alkyl, benzyl or phenyl or acyl of from 2 to 7 carbon atoms; and R_5 is hydrogen or C_{1-6} alkyl.

20. A pharmaceutical composition which comprises an antidepressantly effective amount of a compound as claimed in claim **1** together with a pharmaceutically acceptable carrier.

21. A pharmaceutical composition which comprises an anorexically effective amount of a compound as claimed in claim **1** together with a pharmaceutically acceptable carrier.

4,113,870

METHOD FOR TREATMENT OF HYPERTENSION

Toshiji Igarashi, Tokorozawa, and Yoshikage Nakajima, Tokyo, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

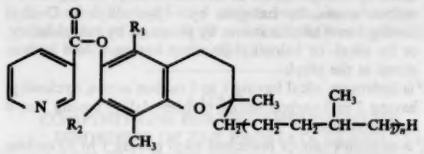
Filed Aug. 4, 1977, Ser. No. 821,910

Claims priority, application Japan, Aug. 11, 1976, 51-94948

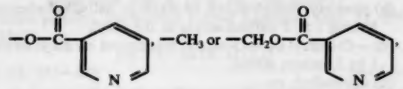
Int. Cl.[2] **A61K** *31/455*

U.S. Cl. 424—266 **8 Claims**

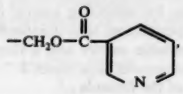
1. A method of treating hypertension which comprises administering to a hypertensive subject requiring such treatment, a therapeutically effective amount of a compound having the formula:



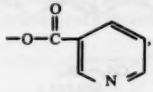
wherein *n* is an integer of from 0 to 3, R_1 is



and R_2 is $-CH_3$ or



with the proviso that when R_1 is



R_2 is $-CH_3$ and with the further proviso that R_1 and R_2 are not $-CH_3$ simultaneously.

4,113,871

HYPOGLYCEMICALLY AND HYPOLIPIDEMICALLY ACTIVE DERIVATIVES OF PHENYL-ALKANE-CARBOXYLIC ACIDS

Kurt Stach, deceased, late of Mannheim-Waldhof, Germany (by Werner Plattner, executor); Elmar Bosies, Heppenheim; Ruth Heerdt, Mannheim-Feudenheim; Hans-Frieder Kühnle, Mannheim-Neuostheim, and Felix Helmut Schmidt, Mannheim-Seckenheim, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

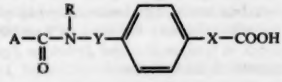
Filed Apr. 8, 1976, Ser. No. 674,993

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1975, 2517229; Feb. 6, 1976, 2604560

Int. Cl.[2] A61K *31/42, 31/34*

U.S. Cl. 424—272 **10 Claims**

1. A phenyl-alkane-carboxylic acid of the formula



wherein

A is isoxazolyl, benzoxazolyl, benzofuranyl or partially hydrogenated benzofuranyl optionally substituted by at least one halogen, or alkyl or alkoxy containing up to 5 carbon atoms,

Y is a valency bond or an unbranched or branched lower alkylene radical containing up to 3 carbon atoms,

X is a straight or branched, saturated or unsaturated divalent aliphatic hydrocarbon radical containing 2 to 8 carbon atoms, there being at least 2 carbon atoms between the benzene ring and the carboxyl group, and

R is a hydrogen atom or a lower alkyl radical,

or a physiologically compatible salt, ester thereof with a lower alkanol, amino alkanol or alkoxy alkanol, or amide thereof with an alkyl-amine or carboxy-substituted amine.

6. A hypoglycaemic or hypolipidaemic composition comprising a hypoglycaemically or hypolipidaemically effective amount of a compound according to claim **1** in admixture with a physiologically compatible diluent.

4,113,872

4-SUBSTITUTED PYRAZOLES

Eike Möller, Wuppertal, Germany; Karl Meng, deceased, late of Wuppertal, Germany (by Ilse Heide Frieda Meng, heiress); Egbert Wehinger, Neviges, Germany; Harald Horstmann, Wuppertal, Germany, and Friedel Seuter, Neviges, Germany, assignors to Baker Aktiengesellshaft, Germany

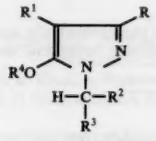
Division of Ser. No. 693,970, Jun. 8, 1976. This application Feb. 7, 1977, Ser. No. 766,235

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1975, 2526467

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 P **11 Claims**

1. A method of treating thromboses in humans and animals which comprises administering to a human or animal in need thereof an anti-thrombolitically effective amount of a compound of the formula



wherein

R is hydrogen or lower alkyl;

R^1 is haloalkylthio of 1 to 4 carbon atoms in the alkyl moiety and 1 to 3 halo atoms;

R^2 is lower alkyl;

R^3 is aryl of 6 to 10 carbon atoms unsubstituted or substituted by 1 to 3 of the same or different substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, trifluoromethyl, trifluoromethoxy, mono- or dialkylamino of 1 to 4 carbon atoms in each alkyl moiety, nitro, cyano, carboxamido, sulphonamido and SO_n-alkyl of 1 to 4 carbon atoms in the alkyl moiety and wherein *n* is 0 to 2; or phenyl having fused thereto a 5- to 7-membered isocyclic ring; and

R^4 is R^5CO wherein R_5 is lower alkyl, cycloalkyl of 5 to 7 carbon atoms, halo(lower alkyl), lower alkoxy, lower alkylthio, halo(lower alkoxy), halo(lower alkylthio), lower alkoxy(lower alkyl), mono- or di(lower alkylamino), phenyl substituted by 1 to 3 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, trifluoromethyl, trifluoromethoxy, nitro, cyano, carboxamido, sulphonamido, SO_n-(lower alkyl) wherein *n* is 0 to 2, and SO_n—CF_3 wherein *n* is 0 to 2; or phenyl having fused thereto a 5- to 7-membered isocyclic ring, in combination with a pharmaceutically acceptable carrier.

4,113,873

8-AZAPROSTANOIC ACID DERIVATIVES

Junichi Himizu, Urawa; Shoichi Harigaya, Kawasaki; Shigeyoshi Saijo, Urawa; Masao Wada, Warabi; Katsuyuki Noguchi, Kitamoto, and Osasi Takaiti, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co. Ltd., Osaka, Japan

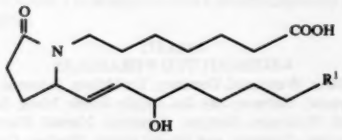
Continuation-in-part of Ser. No. 733,006, Oct. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 677,327, Apr. 15, 1976, abandoned. This application May 5, 1977, Ser. No. 793,920

Claims priority, application Japan, Apr. 26, 1975, 50-50907; Apr. 30, 1975, 50-52930; Oct. 9, 1976, 51-121698; Oct. 9, 1976, 51-121699

Int. Cl.[2] A61K *31/40;* **C07D** *207/26*

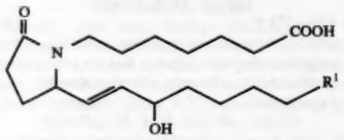
U.S. Cl. 424—274 **12 Claims**

1. A compound of the formula:



wherein R^1 is ethyl or n-propyl, or a pharmaceutically acceptable salt thereof.

12. A pharmaceutical composition which comprises a therapeutically effective amount of a compound of the formula:



wherein R^1 is ethyl or n-propyl, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier therefor.

4,113,874

PYRROLIDONES, PHARMACEUTICAL COMPOSITIONS THEREWITH AND PROCESSES OF USE THEREOF

Adolf Linkies, Frankfurt am Main; Dieter-Bernd Reuschling, Butzbach; Klaus Kuhlein, Kelkheim, Taunus; Gerhard Beck, Frankfurt am Main, and Josef Musil, Konigstein, Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

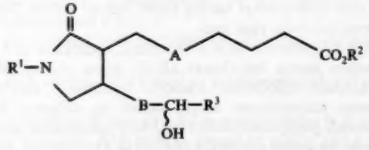
Filed Dec. 16, 1976, Ser. No. 751,173

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557335

Int. Cl.[2] C07D *207/26;* **C07C** *177/00*

U.S. Cl. 424—274 **12 Claims**

1. A compound of the formula



or a physiologically-compatible metal or amine salt of the free acid form thereof, wherein

A is $-CH_2-CH_2-$, $CH=CH$-(cis), or $-C\equiv C-$;

B is $-CH=CH-$ (trans) or, when A is $-CH_2-CH_2-$, is $-CH=CH-$ (trans) or $-CH_2-CH_2-$;

R^1 is hydrogen, hydroxymethyl, phenyl, or phenyl substituted by straight-chain or branched alkyl having 1 to 4 carbon atoms, by halogen, by —S— alkyl or O-alkyl having 1 to 4 carbon atoms, by phenoxy, by halophenoxy, or by alkyl- or haloalkyl-phenoxy having 1 to 4 carbon atoms in the alkyl;

R^2 is hydrogen, alkyl having 1 to 5 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, or phenylalkyl having 7 or 8 carbon atoms;

R^3 is straight-chain or branched alkyl having 1 to 10 carbon atoms or is such alkyl substituted by

(a) —O-alkyl or —S-alkyl having 1 to 5 carbon atoms in the alkyl;

(b) phenoxy, halophenoxy, or alkyl- or haloalkyl-phenoxy having 1 to 3 carbon atoms in the alkyl,

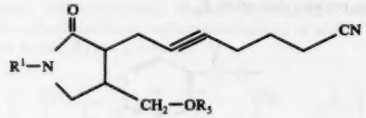
(c) —O-benzyl or —O-benzyl substituted by alkyl having 1 to 3 carbon atoms,

(d) cycloalkyl, or

(e) phenyl or alkylphenyl wherein the alkyl has 1 to 3 carbon atoms.

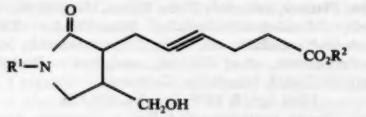
2. A pharmaceutical composition for inducing luteolysis or bronchospasmolysis, for inhibiting gastric juice secretion, or for combatting hypertension, said composition comprising a pharmaceutically-suitable carrier and a therapeutically-effective amount of a compound as in claim 1.

7. A compound of the formula



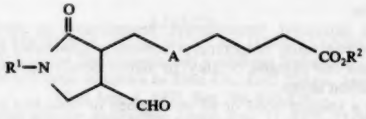
wherein R^5 is allyl, benzyl, tert. butyl, chloromethyl, or an enol ether protective group and R^1 is hydrogen, hydroxymethyl, phenyl, or phenyl substituted by straight-chain or branched alkyl having 1 to 4 carbon atoms, by halogen, by —S— alkyl or —O-alkyl having 1 to 4 carbon atoms, by phenoxy, by halophenoxy, or by alkyl- or haloalkyl-phenoxy having 1 to 4 carbon atoms in the alkyl.

8. A compound of the formula



wherein R^2 is alkyl having 1 to 5 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, or phenylalkyl having 7 or 8 carbon atoms, and R^1 is hydrogen, hydroxymethyl, phenyl, or phenyl substituted by straight-chain or branched alkyl having 1 to 4 carbon atoms, by halogen, by —S— alkyl or —O-alkyl having 1 to 4 carbon atoms, by phenoxy, by halophenoxy, or by alkyl- or haloalkyl-phenoxy having 1 to 4 carbon atoms in the alkyl.

10. A compound of the formula



wherein

A is $-CH_2-CH_2-$, $-CH=CH$-(cis), or $-CH\equiv CH-$,

R^2 is alkyl having 1 to 5 carbon atoms, cycloalkyl having 3 to 8 carbon atoms, or phenylalkyl having 7 or 8 carbon atoms, and R^1 is hydrogen, hydroxymethyl, phenyl, or phenyl substituted by straight-chain or branched alkyl

having 1 to 4 carbon atoms, by halogen, by —S— alkyl or —O-alkyl having 1 to 4 carbon atoms, by phenoxy, by halophenoxy, or by alkyl- or haloalkyl-phenoxy having 1 to 4 carbon atoms in the alkyl.

4,113,875

COMPOSITIONS FOR THE TREATMENT OF DISORDERS OF THE PROSTATE GLAND

Jacques Debat, Paris, France, assignor to Institut de Recherches Chimiques et Biologiques Appliquees, France

Division of Ser. No. 557,369, Mar. 11, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,915

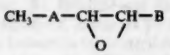
Claims priority, application United Kingdom, Mar. 11, 1974, 10683/74

Int. Cl.[2] A61K *31/335*

U.S. Cl. 424—278 **10 Claims**

1. A therapeutic composition suitable for use in the treatment of prostate adenoma which comprises a therapeutically active amount of at least one aliphatic epoxy compound, which is selected from the group consisting of

(a) epoxy alkanes corresponding to the general formula



(I)

in which B is H or CH_3 and A represents a hydrocarbon radical containing between 15 and 20 carbon atoms, and

(b) their geometric isomers, and a physiologically acceptable excipient.

4,113,876

SULFONIC ACID-N-METHYLAMIDO-N-SULFENYL-N-METHYL-CARBAMIC ACID ESTERS

Peter Siegle, Cologne; Engelbert Kühle, Bergisch-Gladbach; Ingeborg Hammann, Cologne; Bernhard Homeyer, Opladen, and Wolfgang Behrenz, Overath-Steinebrueck, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

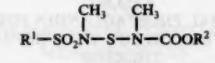
Filed Jul. 2, 1975, Ser. No. 592,860

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1974, 2434184

Int. Cl.[2] A01N *9/16*; C07D *307/86, 317/28*

U.S. Cl. 424—278 **7 Claims**

1. A sulfonic acid-N'-methylamido-N'-sulfenyl-N-methyl-carbamic acid ester of the formula



in which

R^1 is dialkylamino with 1–4 carbon atoms in each alkyl group, or phenyl substituted in the o-, m- or p-position by NO_2, CF_3 or CN, and

R^2 is phenyl, naphthyl, benzodioxolanyl or indanyl; phenyl, naphthyl, benzodioxolanyl or indanyl substituted one to three times by trihalogenomethyl, halogen, nitro, cyano, formamidino, dioxanyl or dioxolanyl, or by alkyl, alkenyl, alkynyl, alkoxy, alkenoxy, alkynoxy, alkylmercapto or alkenylmercapto having up to 4 carbon atoms, or by dialkylamino wherein each hydrocarbon portion has 1–4 carbon atoms; cycloalkyl of 5–7 carbon atoms, or, provided that R^1 is NO_2-substituted phenyl, R^2 may be 2,3-dihydrobenzofuranyl-(7) or 2,3-dihydrobenzofuranyl-(7) mono- or di-substituted in 2-position by alkyl of 1–4 carbon atoms.

5. An insecticidal, acaricidal or nematicidal composition containing as active ingredient an insecticidally, acaricidally or nematicidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,113,877

SUBSTITUTED 2-AMINOMETHYLPHENYL SULFAMATES

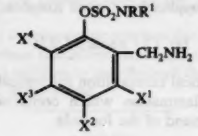
Robert L. Smith, Lansdale; Gerald E. Stokker, Gwynedd Valley, and Edward J. Cragoe, Jr., Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 16, 1977, Ser. No. 833,930

Int. Cl.[2] A61K *31/095*; C07C *141/16*

U.S. Cl. 424—303 **10 Claims**

10. A method for the treatment of edema and hypertension which comprises administering a unitary dosage of a compound of the formula:



wherein

R is hydrogen, straight or branched chain lower alkyl of 1–5 carbon atoms, aralkyl up to 8 carbon atoms or phenyl;

R^1 is hydrogen, straight or branched chain lower alkyl of 1 to 5 carbon atoms, aralkyl of up to 8 carbon atoms or phenyl;

X^1 is hydrogen, lower alkyl of 1 to 3 carbon atoms or lower alkoxy of 1 to 3 carbon atoms;

X^2 is halogen or straight or branched chain lower alkyl wherein the alkyl group has up to 5 carbon atoms;

X^3 is hydrogen, halogen, lower alkyl having up to 5 carbon atoms or lower alkoxy having up to 5 carbon atoms;

X^4 is halogen;

and the non-toxic pharmaceutically acceptable salts thereof.

4,113,878

CONTROL OF PATHOGENIC FUNGI WITH FLUORINATED CARBONATES

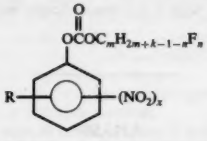
Donald E. Hardies, Wadsworth, and Jay K. Rinehart, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 505,419, Sep. 12, 1974, Pat. No. 4,022,609, which is a division of Ser. No. 299,968, Oct. 24, 1972, Pat. No. 3,852,464, which is a division of Ser. No. 76,275, Sep. 28, 1970, Pat. No. 3,742,010. This application Apr. 5, 1977, Ser. No. 784,874

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—301 **38 Claims**

5. A method of preventing the establishment of a pathogenic fungus population in a region free from mites which comprises applying to the region an effective amount, which prevents the establishment of said fungus, of a compound represented by the structural formula:



wherein:

x is 1, 2, or 3;

k is -2, 0, or 2;

m is an integer ranging from 1 to 15 when k is 2;

m is an integer ranging from 2 to 15 when k is 0 or -2;

n is an integer ranging from 1 to $(2m+k-1)$; and

R is hydrogen, lower alkyl, halo lower alkyl, lower alkenyl, halo lower alkenyl, lower alkylthio, halo lower alkylthio,

lower alkenylthio, halo lower alkenylthio, lower cycloalkyl, or halo lower cycloalkyl.

4,113,879

PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Geraint Jones, and David Summers Thomson, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

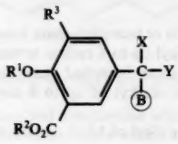
Filed Dec. 6, 1976, Ser. No. 747,995

Claims priority, application United Kingdom, Dec. 29, 1975, 52999/75

Int. Cl.[2] A61K *31/275*

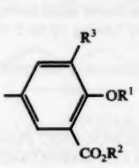
U.S. Cl. 424—304 **6 Claims**

1. A pharmaceutical composition for topical administration to an area of inflammation which comprises an effective amount of a compound of the formula:



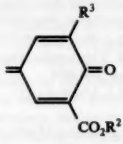
I

wherein either X is hydrogen and Y is a radical of the formula:



II

or X and Y together are a radical of the formula:



III

and wherein R^1 is hydrogen or an acetyl radical; R^2 is hydrogen, R^3 is hydrogen, a C_{1-6}alkyl radical or a halogen atom; and B is a phenyl radical which may optionally bear from 1 to 3 cyano substituents; or a pharmaceutically acceptable salt thereof; together with a pharmaceutically acceptable diluent or carrier.

4,113,880

2'-HYDROXY-3'-CARBOXY-5'-NITROOXANILATE COMPOUNDS, COMPOSITIONS, AND METHODS OF USE

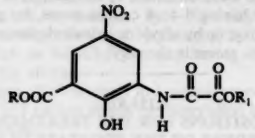
Charles M. Hall, and John B. Wright, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 17, 1976, Ser. No. 742,438

Int. Cl.[2] A61K *31/24*

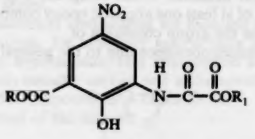
U.S. Cl. 424—309 **41 Claims**

1. A compound of the formula



wherein R is hydrogen, a physiologically acceptable metal or amine cation or alkyl of one to eight carbon atoms, inclusive; R_1 is hydrogen, a physiologically acceptable metal or amine cation, or alkyl or one to eight carbon atoms, inclusive.

20. A method for treating mammals for allergy of a reagin medicated nature which comprises prophylactically administering to said mammal an anti-allergy effective amount of a compound of the formula



wherein R is hydrogen, a physiologically acceptable metal or amine cation or alkyl of one to eight carbon atoms, inclusive; R_1 is hydrogen, a physiologically acceptable metal or amine cation, or alkyl of one to eight carbon atoms, inclusive, in association with a pharmaceutical carrier.

4,113,881

METHOD OF TREATING RHEUMATOID ARTHRITIS

Harry Weldon Diehl, 4424 Oak Hill Rd., Rockville, Md. 20853

Continuation-in-part of Ser. No. 682,540, May 3, 1976, Pat. No. 4,049,824. This application Aug. 1, 1977, Ser. No. 821,053

The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/23*

U.S. Cl. 424—312 **8 Claims**

1. A method of relieving and inhibiting the symptoms of inflammatory rheumatoid arthritis in mammals which comprises the oral administration to a mammal of an effective amount of cetyl myristoleate.

4,113,882

STABILIZED ORAL PROSTAGLANDIN FORMULATION AND THE PROCESS FOR THE PREPARATION THEREOF

Kiyoshi Okazaki, Kawagoe; Masuo Murakami, Tokyo; Hiroitsu Kawada, Kawagoe; Jun Sekino, Kashiwa; Hidemi Shimizu, Tokyo, and Shigemi Kawahara, Higashikurume, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 516,217, Oct. 21, 1974, Pat. No. 4,036,954. This application May 13, 1976, Ser. No. 686,154

Claims priority, application Japan, May 20, 1975, 50/60070

The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/19, 31/215*

U.S. Cl. 424—317 **18 Claims**

1. A stabilized oral prostaglandin composition comprising a therapeutically effective amount of a lyophilized composition which comprises (A) a prostaglandin E group compound and (B) an effective amount of at least one member selected from the group consisting of hydroxypropyl cellulose, hydroxyethyl cellulose, carboxymethyl cellulose, a lower alkyl cellulose, a dextran, and dextrin; and a pharmaceutically acceptable carrier for oral administration.

4,113,883

ANAESTHETIC COMPOSITIONS

Robert David Bagnall, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 16, 1976, Ser. No. 677,855

Claims priority, application United Kingdom, Apr. 29, 1975, 17698/75

Int. Cl.[2] A61K *31/08*

U.S. Cl. 424—342 7 Claims

7. A method for producing anaesthesia in a warm-blooded animal which comprises administering by inhalation to said animal an anaesthetically-effective amount of 1,2,2-trifluoroethyl difluoromethyl ether together with sufficient oxygen to maintain respiration.

4,113,884

PROCESS FOR THE PREPARATION OF A CONCENTRATE FROM WASTE CHICKEN-BROTH AND PRODUCT THEREFROM

Branko Kraševec; Eli Mihelič, and Suzana Reutlinger, all of Ljubljana, Yugoslavia, assignors to HP Kolinska Ljubljana Prehrambena Industrija (n.sol.o.), Ljubljana, Yugoslavia

Filed Mar. 16, 1977, Ser. No. 778,319

Claims priority, application Yugoslavia, Nov. 25, 1976, 2883/76

Int. Cl.[2] A23L *1/313, 1/315, 1/40*

U.S. Cl. 426—56 3 Claims

1. A process of preparing a nutritional concentrate from waste chicken broth which contains dry solids as well as insoluble residues and fats, comprising the steps of heating the broth to a temperature of substantially 50°–55° C.; adding to the heated broth an acqueous suspension of anti-gelling enzyme within the range of substantially 0.4 to 0.9% by weight of the dry broth solids; stirring the broth and enzyme for substantially 20–60 minutes while at said temperature; adding an anti-foaming agent in an amount up to 1% by weight of the dry broth solids; boiling the broth with the therein admixed enzyme and anti-foaming agent for approximately 10 minutes to segregate the insoluble residues and fats from the dry solids; removing the segregated insoluble residues and fats; and concentrating the remainder of the broth.

4,113,885

METHOD OF PRODUCING CURED LOW SODIUM MEAT PRODUCTS

Thadeus B. Zyss, 7088 Browning Rd., Highland, Calif. 92346

Continuation-in-part of Ser. No. 660,110, Feb. 23, 1976, abandoned. This application Jun. 29, 1977, Ser. No. 811,165

Int. Cl.[2] A23B *4/02;* A23L *1/27*

U.S. Cl. 426—264 9 Claims

1. In a method for curing fresh primal cuts of meat intended for consumption by those on a low sodium diet which does not require the presence of phosphate, chloride, nitrate or sodium ions, the step consisting essentially of:

injecting an aqueous curing solution into a fresh primal cut in an amount corresponding to about 1.0 to about 20% of the weight of said primal cut,

said curing solution being free of (a) organic nitrites (b) phosphate, chloride, nitrate and sodium ions except for the nominal present in commercial water supplies used in making up the solution; and

said curing solution containing from about 0.005 to about 0.40% by weight of a nitrite selected from the group consisting of potassium nitrite, ammonium nitrite, nitrous acid and mixtures thereof.

4,113,886

MEMBRANE DECAFFEINATION

Saul Norman Katz, Monsey, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,349

Int. Cl.[2] A23F *1/10*

U.S. Cl. 426—422 7 Claims

1. A method for decaffeinating an aqueous caffeine-containing solution comprising the steps of:

(a) contacting one side of a porous, solvent-filled membrane with an aqueous, caffeine-containing solution, said solvent being a water-immiscible, caffeine-specific solvent comprising at least 70% by weight of the filled membrane,

(b) contacting the opposite side of the membrane with a water phase,

(c) maintaining the respective contacts for a sufficient period of time to reduce the caffeine concentration of the solution by permitting caffeine to pass through the filled membrane and into the water phase.

4,113,887

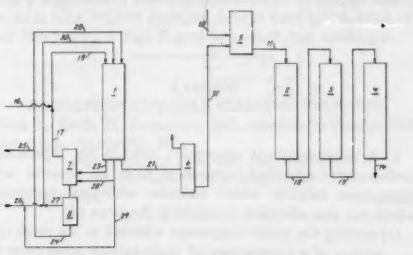
ADSORPTION PROCESS

Franklin Kramer, Briarcliff Manor; Yair Steve Henig, Pearl River; Torunn Atteraas Garin, Bronxville, and Gerald James Vogel, Ossining, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,485

Int. Cl.[2] A23F *1/10;* B01D *15/06*

U.S. Cl. 426—422 11 Claims



1. A countercurrent adsorption process for separating a preferentially adsorbed component from an aqueous multi-component solution which contains additional compounds which are also adsorbed comprising the steps of:

(a) passing the multi-component solution to the most spent section of a countercurrent, multi-section adsorption system and withdrawing the solution from the least spent section of said system until a desired amount of the preferentially adsorbed component is adsorbed on the most loaded adsorbent, thereafter

(b) passing an aqueous solution of solids through said most loaded adsorbent and obtaining effluent therefrom, said solution having a higher concentration of the preferentially adsorbed component but a lower total solids concentration than present in the multi-component solution of step (a), and said solids comprising solids desorbed during prior adsorbent regeneration steps,

(c) adding fresh adsorbent to the least spent section of the countercurrent adsorption system,

(d) passing an amount of the effluent of step (b) to the most spent section of the countercurrent adsorption system together with an amount of the multi-component solution, the amount of said effluent being sufficient to effect a reflux ratio for the preferentially adsorbed component of 0.01:1 to 5:1, thereafter

(e) passing a desorbent through the adsorbent of step (b) in order to remove adsorbed solids, said solids having, on a dry basis, a relatively high level of the preferentially-adsorbed component.

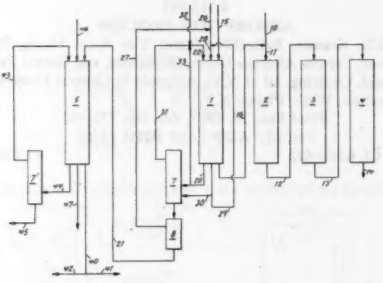
10. The process of claim 1 wherein the reflux ratio is from about 0.5:1 to 1.5:1.

4,113,888

ADSORPTION PROCESS

Yair Steve Henig, Pearl River, and Kailash S. Purohit, Spring Valley, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 24, 1977, Ser. No. 771,486
Int. Cl.[2] A23F 1/10; B01D 15/02
U.S. Cl. 426—422 **10 Claims**



1. A countercurrent adsorption process for separating a preferentially adsorbed component from an aqueous multi-component solution which contains additional compounds which are also adsorbed comprising the steps of:

(a) passing the multi-component solution to the most spent section of a countercurrent multi-section adsorption system until the capacity of the most loaded adsorbent for adsorbtion of the preferential adsorbed component is substantially reached and withdrawing from the least spent section of the adsorption system an aqueous solution substantially-free of the preferentially adsorbed component, thereafter

(b) adding fresh adsorbent to the least spent section of the countercurrent adsorption system and passing the multi-component solution to a new most spent section of the countercurrent adsorption system,

(c) isolating the loaded adsorbent of step (a) and passing a desorbent through this adsorbent in order to obtain an effluent containing desorbed solids, said solids having, on a dry basis, a higher level of the preferentially adsorbed component than that present in the multi-component solution of step (a),

(d) removing the desorbent from the effluent of step (c) in order to obtain an aqueous solution of desorbed solids,

(e) passing the aqueous solution of step (d) through a fresh bed of the same adsorbent used in step (a), and obtaining an effluent at least the initial portion of which is substantially-free of the preferentially adsorbed component, and thereafter

(f) passing a desorbent through the bed of step (e) in order to obtain an effluent containing desorbed solids, said solids having on a dry basis, a higher level of the preferential adsorbed component than that present in the effluent of step (c).

4,113,889

PROCESS FOR MAKING HYDRATED PEANUT PRODUCTS AND PRODUCTS MADE THEREBY

James Russell Baxley, Edenton, N.C., assignor to Peanut Research & Testing Laboratories, Inc., Edenton, N.C.

Continuation of Ser. No. 613,311, Sep. 15, 1975, abandoned. This application Mar. 18, 1977, Ser. No. 779,030
Int. Cl.[2] A23L 1/36
U.S. Cl. 426—509 **1 Claim**

1. The method of making comminuted hydrated peanut products, comprising the sequential steps of

(a) first, mechanically blanching shelled whole peanuts at ambient temperatures and in a dry condition, whereby the skins are fully removed therefrom,

(b) then, adjusting the moisture content of the blanched nuts to 3 to 8% by weight and pressing the blanched whole nuts under pressure of 2000 to 5000 psig to remove a substantial portion of the fat therefrom without breaking the nuts,

(c) cooking said whole and partially defatted blanched peanuts in the presence of plain water in a weight ratio of at least 1 part nuts to 3 parts water at a temperature between 150° and 300° F. under pressure when at temperatures above the boiling point for a period of 10 to 60 minutes to gelatinize the starch and coagulate the proteins in said peanuts and hydrate the peanuts to a preselected moisture content whereby the nuts absorb an amount of water substantially equal to the weight of the nuts,

(d) then, draining the cooked nuts, and,

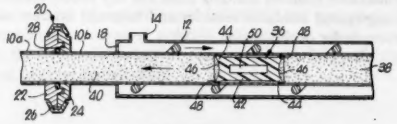
(e) then, comminuting the cooked peanuts.

4,113,890

METHOD OF COOKING A FLOWABLE FOOD PRODUCT IN A CONTINUOUS FLOW SCRAPED SURFACE HEAT EXCHANGER

Marshall Long, Leawood, Kans., assignor to Marlen Research Corporation, Overland Park, Kans.

Continuation-in-part of Ser. No. 639,659, Dec. 11, 1975, abandoned. This application Oct. 13, 1977, Ser. No. 841,890
Int. Cl.[2] A22C 11/04; A01J 25/13; B08B 9/04
U.S. Cl. 426—512 **7 Claims**



1. A method of cooking a flowable food product that includes the steps of:

forcing the product under pressure through a thermally conductive tube having a substantially rigid, annular wall;

heating said wall of the tube so that the temperature of the product will be raised as the product flows through the tube,

the amount of heat supplied to the tube being sufficient to cause some of the product to adhere to the wall if such adherence is not otherwise prevented;

continuing to force the product through the tube and to expose the same to said heated wall thereof for a predetermined length of time;

maintaining a supply of individual scraping plugs outside of said tube, each of which has an external dimension substantially corresponding to the transverse, internal dimension of said tube;

continuously inserting said plugs in succession into said tube for continuous flow with the product at spaced intervals in the latter;

advancing the plugs and the product together through the tube at the same rate and with the plugs scraping said wall;

controlling the rate of product and plug flow with a first control means;

controlling the frequency of plug insertion with a second control means operating independently of said first control means so that, although the plugs and product move together through the tube at the same rate of flow, the frequency of plug insertion may be varied independently of and without affecting the flow rate of the product and plugs in accordance with the frequency of scraping needed to maintain the wall substantially free of accumulations of the product;

restricting the movement of product and plugs to advance continuously through the tube to one direction only with respect to the longitudinal axis of the tube; removing product from the tube that has been exposed to the heated wall for said predetermined length of time; and removing the plugs in succession from the tube when their movement with the product has been completed, said step of controlling the frequency of plug insertion independently of the rate of product and plug flow including obtaining portions of the cooked product of a size that corresponds to said frequency of plug insertion.

4,113,891

FLAVORING AGENTS

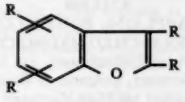
Max Winter, Petit-Lancy; Fritz Gautschi, Commugny; Ivon Flament; Max Stoll, both of Petit-Lancy, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 482,819, Jun. 24, 1974, Pat. No. 4,038,435, which is a division of Ser. No. 243,866, Apr. 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sep. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, Apr. 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, Apr. 30, 1965, abandoned. This application Mar. 11, 1977, Ser. No. 825,111

Int. Cl.[2] A23L *1/234*

U.S. Cl. 426—536 **40 Claims**

1. A composition selected from the group consisting of foodstuff and beverages to which has been added an effective, flavor-improving amount of a benzofuran compound having the following formula:



Wherein R is hydrogen, an alkyl group having 1 or 2 carbon atoms, or an alkenyl group having 2 or 3 carbon atoms, provided the sum of the carbon atoms of the substituent groups does not exceed 3.

4,113,892

METHOD OF PROCESSING FERMENTED SOYBEANS AND FOOD PRODUCTS PREPARED THEREFROM

Junichi Shimizu; Takashi Hara; Tatsuya Iwakura, and Yoshiro Itaya, all of Tokyo, Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

Filed Aug. 24, 1976, Ser. No. 717,322

Claims priority, application Japan, Aug. 28, 1975, 50-103492; Aug. 28, 1975, 50-103493; Mar. 19, 1976, 51-29223; Apr. 12, 1976, 51-40233; Jul. 7, 1976, 51-79824

Int. Cl.[2] A23D *5/00;* **A21D** *13/08;* **A23L** *1/20, 1/168*

U.S. Cl. 426—602 **24 Claims**

1. A method of processing fermented soybeans comprising freeze-drying the fermented soybeans in a vacuum and separating the dried soybeans into an outer layer portion and an inner portion.

4,113,893

RADIATION CURE OF COATING COMPOSITIONS CONTAINING DIACRYLATE MONOMER AND HIDING PIGMENT

Ernest A. Hahn, Sewickley, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 592,308, Jul. 1, 1975, abandoned, which is a continuation-in-part of Ser. No. 261,479, Jun. 9, 1972, abandoned. This application Mar. 16, 1977, Ser. No. 778,210

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 427—44 **16 Claims**

1. A method comprising exposing a coating of an ionizing irradiation curable coating composition comprising:

a. diacrylate monomer which is 3-acrylyloxy-2,2-dimethylpropyl 3-acrylyloxy-2,2-dimethylpropionate, 1,3-bis(acrylyloxy-2,2-dimethylpropane or mixtures thereof and which constitutes from about 30 percent to 100 percent by weight of the binder of said coating composition;

b. hiding pigment which is titanium dioxide, zinc oxide, lithopone or mixtures thereof wherein the hiding pigment to diacrylate monomer weight ratio of said coating composition is in the range of from about 0.3:1 to about 3:1; and

c. from about 0.5 to about 10 percent triphenyl phosphine by weight of said composition

while the surface of said coating opposite the substrate upon which it is coated is in contact with a curing atmosphere containing from about 300 to about 1000 parts oxygen by volume per million parts curing atmosphere by volume, to at least about 4 megarads of ionizing irradiation of an energy equivalent to at least 100,000 electron volts to cure said coating to a hard film having a high degree of surface mar resistance.

4,113,894

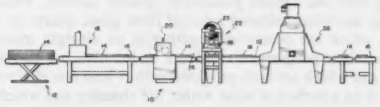
RADIATION CURABLE COATING PROCESS

Robert L. Koch, II, Evansville, Ind., assignor to George Koch Sons, Inc., Evansville, Ind.

Filed Oct. 12, 1976, Ser. No. 731,755

Int. Cl.[2] B01J *1/10;* **B32B** *31/28*

U.S. Cl. 427—44 **10 Claims**



1. A process of applying a predetermined surface finish to a panel comprising the steps of coating the surface of the panel with a radiation curable liquid coating material; covering the liquid coated panel surface with a radiation permeable casting film having a predetermined surface finish on its side in contact with the coated panel, rolling the film on the panel to cause the uncured coating material intimately to conform to said predetermined casting film surface finish; and then irradiating the coated panel through said casting film to cause the coating material to cure in conformance with the predetermined surface finish on said casting film.

4,113,895

METHOD FOR PRODUCING MULTILAYERED COATED SUBSTRATE

William R. Watt, Princeton Junction, N.J.; Edmund G. Astolfi, Greenwich, Conn., and Jay K. Laufer, Huntington Sta., N.Y., assignors to American Can Company, Greenwich, Conn.

Filed Nov. 19, 1976, Ser. No. 743,133

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—44 **15 Claims**

1. A method for producing a multilayer coating which comprises:

(1). applying as a first layer to a substrate a radiation-curable ink composition comprising at least one ethylenically unsaturated material polymerizable to higher molecular weight and a photosensitizer which releases an active catalyst effective to initiate curing of said material upon exposure to radiation:

(2). without drying or actively effecting curing of said first layer, applying to said first layer a radiation-curable varnish composition comprising at least one epoxide material polymerizable to higher molecular weight and a photosensitizer which initiates curing of said material upon exposure to radiation; said first layer composition being devoid of components that act to substantially inhibit or retard the action of the catalyst precursor in said second layer; and

(3). exposing the coated substrate to irradiation to produce a hardened multilayered coated substrate.

4,113,896

METHOD OF MANUFACTURING AN ELECTRICALLY CONDUCTIVE CONTACT LAYER

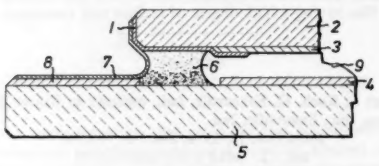
Hildegard Keiner, Ay, Iller; Emil Schmid, Oberelchingen, and Walter Richly, Ulm-Wiblingen, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Nov. 17, 1976, Ser. No. 742,688

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1975, 2552181

Int. Cl.² H01J *61/36*

U.S. Cl. 427—108 **14 Claims**



1. In a method of forming a gas discharge display device having first and second juxtaposed spaced carriers, formed from an insulating material selected from glass, quartz or ceramic, which are connected together in an air-tight manner adjacent their periphery to define a sealed chamber therebetween and which are each provided with at least one electrode which is on a surface of same within the chamber and which is connected via a conductor to the exterior of the chamber; said method including applying an electrode as a coating of electrically conductive material on a portion of the major surface of each of said carriers which will be within the chamber, connecting a conductor to each of said electrodes, and then connecting the carriers together in an air-tight manner by means of a glass solder which likewise forms an air-tight seal with said conductor; the improvement wherein said step of connecting includes forming at least one of said conductors as a conductive layer on the surface of the associated said carrier so that it contacts a portion of said electrode and extends to a portion of the surface of said associated carrier which will be outside of said chamber by:

producing a paste like mixture of from 60 to 98% by weight of silver or silver oxide, from 2 to 40% by weight of glass powder, and an effective amount of a vaporizable liquid agent:

applying the paste in layer form to the desired portion of said carrier and of said electrode coating; and

drying and baking in the paste in air at a temperature of from 350° to 550° C to cause the glass powder to fuse and form an air-tight conductor which adheres to the electrode coating material, which adheres to the material of the carrier in an air-tight manner and which forms an air-tight seal with the glass solder.

4,113,897

SMOOTH GROOVE FORMATION METHOD EMPLOYING SPIN COATING OF NEGATIVE REPLICA OF INSCRIBED DISC

Richard William Nosker, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 29, 1973, Ser. No. 327,804

Int. Cl.² B32B *35/00*; B05D *3/12*

U.S. Cl. 427—140 **7 Claims**

1. A method of preparing a smooth groove in a disc prior to the recording of information therein comprising the steps of:

cutting a groove in a first disc, said groove having valley, wall and peak regions, said peak regions being undesirably subject to irregularities of contour as a consequence of said cutting;

forming a negative replica of said first grooved disc, said negative replica comprising a second disc having a second groove with peak and valley regions corresponding respectively to valley and peak regions of the groove in said first disc;

flowing fluid material of predetermined viscosity over the groove of said second disc while rotating said second disc in a plane about its axis at a predetermined rate, for a sufficient time to drive off the fluid material in excess of that required to provide a continuous coat over the valley, wall and peak regions of the groove of said second disc; and

drying said material to form a continuous material coating over the groove area of said second disc partially filling the valley region of said groove to a depth suitable. for topographically recording information therein, said coating having a smoothly curved surface contour in said valley region formed with substantial independence of variations in the contour of the valley region of the disc groove underlying said coating.

4,113,898

METHOD OF APPLYING POWDER COATINGS OF UNSATURATED BRANCHED HYDROXYESTER RESINS

Arno Gardziella, Witten-Rüdinghausen, and Karl Jellinek, Letmathe, both of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 482,959, Jun. 25, 1974, abandoned, which is a division of Ser. No. 274,950, Jul. 25, 1972, abandoned. This application Jan. 20, 1976, Ser. No. 650,649

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1971, 2137513

Int. Cl.² B05D *3/02*

U.S. Cl. 427—195 **13 Claims**

1. A process for forming a coating on a substrate selected from the group consisting of metal, wood and ceramic, said coating comprising a powdered enamel, said process comprising:

(a) preparing a powdered enamel comprising an unsaturated, branched hydroxyester resin having a hydroxyl number of about 30–110, said resin comprising the reaction product from the esterification of an unsaturated aliphatic or aromatic dicarboxylic acid with a mixture comprising about 75–97 mole percent of a bivalent alcohol and about 25–3 mole percent of a multifunctional alcohol having at least 3 hydroxy groups;

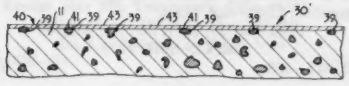
(b) applying said enamel to said substrate; and

(c) heating said powder enamel to its melting point so as to form a continuous coating on said substrate.

4,113,899
METHOD OF OBTAINING ELECTROLESS NICKEL COATED FILLED EPOXY RESIN ARTICLE

Russell Alger Henry, East Moline, and Ernest Moreland Summers, Moline, both of Ill., assignors to Wear-Cote International, Inc., Rock Island, Ill.

Filed May 23, 1977, Ser. No. 799,772
Int. Cl.[2] C23C 3/02
U.S. Cl. 427—290 **7 Claims**



1. In a method for the electroless nickel coating of an article comprising, on the surface of said article, a cured epoxy resin matrix containing generally minus 60 mesh metal filler particles uniformly distributed through said matrix, said article being selected from the group consisting of foundry patterns and core boxes, which method utilizes only said metal filler particles as sites for electroless nickel deposition and does not involve activation of the resin surface and the metal filler particles with oxidation and a catalytic treatment to provide such sites, the improvement which comprises the following steps:

(a) impinging the surface of a said article with inert particles, having a Moh's scale hardness in excess of 4.5 and a U.S. Standard mesh size such that a major amount by weight of said particles will pass a 60 mesh screen, thereby increasing the number of metal filler particles at the surface of said article which are exposed to the atmosphere and free of any coating of or encapsulation with cured resin;

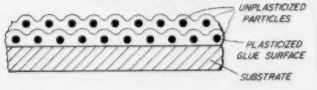
(b) removing any metal oxide film on the exposed surfaces of the exposed metal filler particles by contacting said exposed surfaces with nitric acid for a period of time, less than about 1 minute, sufficient to remove said metal oxide film but insufficient to oxidatively attack said cured epoxy resin matrix; and

(c) immersing the said article treated according to steps (a) and (b) in an electroless nickel plating bath maintained at a temperature ranging from about 160° to 210° F. until initial metallic nickel deposits form on the oxide-free surfaces of said exposed metal filler particles and sufficient additional metallic nickel deposits to bridge over between said initial metallic nickel deposits to form a continuous electroless nickel coating on said article, which coating has a thickness of at least about 5 microns.

4,113,900
CURL-RESISTANT ADHESIVE-COATED PAPER

William R. Lawton, 6651 Jewett-Holmwood Rd., Orchard Park, N.Y. 14127

Filed Feb. 17, 1977, Ser. No. 769,703
Int. Cl.[2] B05D 5/10
U.S. Cl. 427—207 R **8 Claims**



1. A method for adhering a water-remoistenable adhesive to a substrate in the absence of a binding agent, said method comprising the steps of

(a) dispersing a powdered water-remoistenable adhesive comprising a multiplicity of particles in a liquid solution, said liquid solution comprising

(1) an organic liquid comprising a mixture of a first liquid selected from the group consisting of aliphatic and aromatic hydrocarbons, and a second liquid selected from the group consisting of ketones and lower aliphatic alcohols, and

(2) a plasticizer adapted to penetrate outer surface portions of particles of a water-remoistenable adhesive, said plasticizer being selected from the group consisting of polyfunctional amines, alcohol amines, and polyhydric aliphatic alcohols,

thereby to form a binder-free dispersion of unplasticized adhesive particles having plasticized outer surface portions,

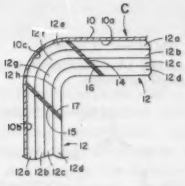
(b) coating a substrate with said binder-free dispersion, and

(c) evaporating said organic liquid, thereby forming on said substrate an adhesive coating resistant to curling accompanying changes in atmospheric humidity and comprising a multiplicity of sintered adhesive particles having plasticized outer surface portions joined directly to one another and to said substrate.

4,113,901
METHOD OF APPLYING A LAYER OF POLYURETHANE FOAM ONTO A CUT OR GROUND SURFACE OF POLYURETHANE FOAM

Michael H. Collins, Huxley, Nr. Chester, England, assignor to Shell Internationale Research Maatschappij, B.V., The Hague, Netherlands

Filed Jun. 4, 1976, Ser. No. 693,273
Claims priority, application United Kingdom, Sep. 22, 1975, 38779/75
Int. Cl.[2] B05D 7/22; B32B 35/00
U.S. Cl. 427—236 **1 Claim**



1. A method of manufacturing a heat-insulating polyurethane foam lining of a container having a rigid outer shell with flat inner wall surfaces that intersect to form corners of the container for transport or storage of liquified gases comprising the steps of:

covering the flat inner surfaces of the rigid outer shell of the container located at both sides of a corner of the container with polyurethane foam by spraying layers of polyurethane foam onto said flat inner surfaces and on top of each other;

cutting or grinding the end parts of the layers of polyurethane foam which are located adjacent to the corner of the intersection of two surfaces to form a gap defined by substantially flat planes adjacent to the corner;

applying a thin layer of a sealing material selected from the group consisting of (1) an epoxy resin formulation and (2) a polyurethane resin formulation, onto the flat planes of the gap and allowing the sealing material to set; and

spraying layers of polyurethane foam onto the layer of sealing material and into the gap between said flat planes and the corner part of the rigid outer shell in order to fill up the gap and to provide a strong bond between foam filling the gap and the layers n the flat surfaces.

4,113,902
FLAME RETARDANTS FOR NATURAL AND SYNTHETIC MATERIALS

Vladimir Mischutin, Union City, N.J., assignor to White Chemical Corporation, Bayonne, N.J.

Continuation of Ser. No. 579,824, May 22, 1975, abandoned, which is a continuation of Ser. No. 483,950, Jun. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 300,731, Oct. 25, 1972, Pat. No. 3,877,974, and Ser. No. 415,667, Nov. 14, 1973, Pat. No. 3,955,032. This application Dec. 17, 1976, Ser. No. 751,661

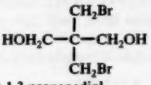
The portion of the term of this patent subsequent to Apr. 15, 1992, has been disclaimed.

Int. Cl.[2] B05D *1/34;* C09K *3/28;* D06M *15/32*

U.S. Cl. 427—390 D 12 Claims

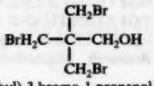
1. A method of rendering textile materials flame retardant, which comprises

wetting said materials with an aqueous dispersion of a brominated aliphatic compound selected from the group consisting of



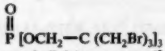
I

2,2-(bromomethyl) 1,3-propanediol (dibromoneopentyl glycol);



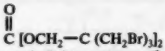
II

2,2-bis (bromomethyl) 3-bromo 1-propanol (tribromoneopentyl alcohol);



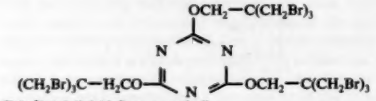
III

Tris [2,2-bis(bromomethyl) 3-bromopropyl] phosphate
Tris (tribromoneopentyl) phosphate;



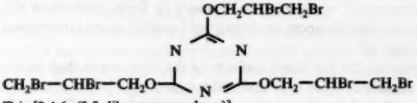
IV

Bis [2,2-bis(bromomethyl) 3-bromopropyl]carbonate
Bis (tribromoneopentyl) carbonate;



V

Tris [2,4,6-(2,2-bis(bromomethyl) 3-bromopropyloxy] 1,3,5-triazine;



VI

Tris [2,4,6- (2,3-dibromopropyloxy)] 1,3,5-triazine;

VII. A polymer obtained by reacting Compound I with phosphorus trichloride ($POCl_3$) in the presence of an acid acceptor;

VIII. A polymer obtained by reacting Compound I with phosgene

in the presence of an acid acceptor; and

IX. A polymer obtained by reacting Compound I with cyanuric chloride in the presence of an acid acceptor;

said brominated aliphatic compound being solid at room temperature,

substantially insoluble in water and having an average particle size of two microns or less in diameter,

together in the same bath with a suitable adhesive polymeric binder, and drying.

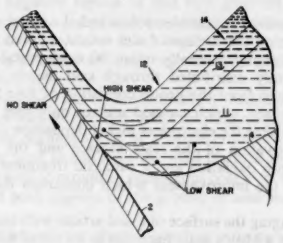
4,113,903
METHOD OF MULTILAYER COATING

Edward J. Choinski, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 27, 1977, Ser. No. 801,144

Int. Cl.[2] B05D *1/30*

U.S. Cl. 427—420 6 Claims



1. In the process of applying a multilayer liquid coating to a moving web as distinct superposed continuous layers that are thinned as they are drawn down on the web, the improvement which comprises applying as the layer next to the web a shear thinning carrier layer of pseudoplastic liquid having a viscosity between 20 and 200 centipoises at a shear rate of 100 sec^{-1} and a viscosity below 10 centipoises at a shear rate of 100,000 sec^{-1}.

4,113,904
FIRE RESISTANT WINDOWS

Werner Kiefer, Mainz, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

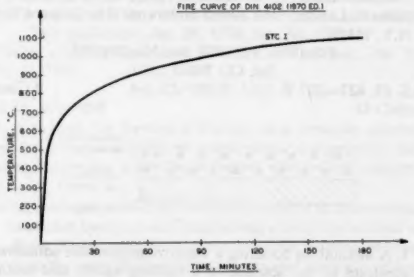
Filed Dec. 3, 1975, Ser. No. 637,424

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1974, 2456991

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.[2] E06B *3/24;* B32B *17/00*

U.S. Cl. 428—34 29 Claims



1. A window comprising a frame and two or more panes which are mounted in the frame and disposed therein in substantially parallel relation, substantially filling the frame opening, at least one of the panes being composed of fire resistant glass which is a borosilicate or aluminosilicate glass and will

withstand heating in accordance with DIN 4102, 1970 Edition, Section 5.2.4, standard temperature curve 1 as shown in FIG. 3 of the drawings, for at least 30 minutes, and has a product of thermal expansion coefficient α and elasticity modulus E of 1 to 5 kp $\times$ cm^{-2} $\times$ °C^{-1}, and has a compressive prestress in the peripheral edge portion thereof.

4,113,905

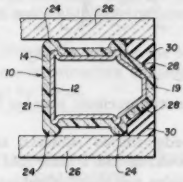
D.I.G. FOAM SPACER

Gerald Kessler, Box 398, Youngstown, Ohio 44501

Filed Jan. 6, 1977, Ser. No. 757,291

Int. Cl.[2] E06B *3/24*; B32B *5/18*

U.S. Cl. 428—34 **3 Claims**



1. In double insulated glass comprising a pair of separated glass panes, an air space therebetween, an elongated spacer between said glass panes about their periphery, and a plastomeric or elastomeric sealant bonding said spacer to said glass panes and sealing the air space therebetween, the improvement wherein:

said spacer is a hollow cast thermoset foam spacer, comprising a thick foam layer of thickness less than 150 mils cast about a very thin extruded hollow core of thickness no greater than about 10 mils, the coefficient of expansion of said spacer being approximately equal to that of glass, to reduce the stress from differential dimensional change between the glass and said spacer, and to reduce heat transfer between said glass panes through said spacer; said spacer having at least one projecting contact edge, running along the length of said spacer, located on each of the two sides of said spacer which contact the glass panes.

4,113,906

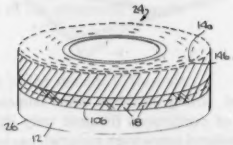
TAPE SPLICING DEVICE AND DISPENSER THEREFOR

Arthur Brandwein, 147-37 77 Ave., Flushing, N.Y. 11367

Filed Aug. 9, 1976, Ser. No. 712,951

Int. Cl.[2] G09F *3/00*; B32B *3/10, 7/06*

U.S. Cl. 428—42 **10 Claims**



1. A roll of tape splicing material comprising a plurality of individually separable adhesive tape strips disposed side-by-side with respect to each other and wound around a core to form coiled layers of said adhesive tape strips, each said tape strip having opposite end portions and a median portion intermediate said opposite end portions, each said tape strip further including an adhesive surface and a non-adhesive surface, a corresponding plurality of tab members secured to the adhesive surface of each of said tape strips from said median portion to one of the end portions of said tape strips and freely extending beyond said one end portion, said tab members including adhesive release means to permit release from said tape strips, said roll of tape splicing material further including a continuous one-piece elongated marginal sheet secured to the adhesive surface of each of said tape strips from said median portion to the other said end portion of said tape strips and extending beyond said other end portion, said marginal sheet not having any slits that extend substantially across said sheet and including adhesive release means to permit release of said tape strips from said marginal sheet, said tab members being separable from said marginal sheet, said marginal sheet being wound directly upon itself in roll form with said tape strips to form coiled layers of said marginal sheet with an underlying coiled layer of said marginal sheet in substantial surface-to-surface contact with an immediate overlying coiled layer of said marginal sheet.

4,113,907

FABRIC-REINFORCED SEALING SHEETS

Karl Haage, Troisdorf-Spich, and Dieter Scharff, Troisdorf-Sieglar, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

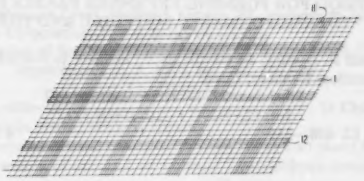
Filed Sep. 3, 1975, Ser. No. 609,944

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1974, 2442156

The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

Int. Cl.[2] B32B *5/08, 3/02*; E04C *1/00*

U.S. Cl. 428—111 **18 Claims**



1. A fabric-reinforced multi-layered sealing sheet of a thermoplastic synthetic resin for large-area sealing purposes in structures within building construction, underground construction, and civil engineering construction, by use of a spot-like or strip-shaped mounting to the structures, which comprises an upper layer of thermoplastic synthetic resin, a lower layer of thermoplastic synthetic resin and a reinforcing fabric embedded therein between said layers, said fabric being provided at spaced intervals with fabric-reinforcing strips extending in one direction or in two mutually perpendicular directions, the upper layer that is to be exposed to weathering conditions containing stabilizers for said thermoplastic synthetic resin and having a higher weathering stability than the lower layer of thermoplastic synthetic resin.

4,113,908

SYNTHETIC PAPER

Toshihiko Shinomura, Yokohama, Japan, assignor to Nippon Oil Company Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 427,098, Dec. 21, 1973, abandoned. This application Dec. 9, 1975, Ser. No. 639,166

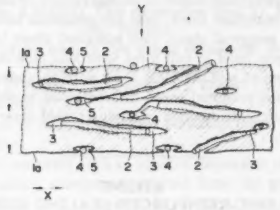
Claims priority, application Japan, Dec. 28, 1972, 48-1961

Int. Cl.[2] B32B *5/12*

U.S. Cl. 428—113 **9 Claims**

1. Synthetic paper comprising a film base material formed from a thermoplastic resin selected from the group consisting of polyethylene, polypropylene, polystyrene, polyvinyl chloride, copolymers using ethylene, propylene, styrene or vinyl chloride as a base material, and mixtures thereof, a number of threadlike fibrous filaments selected from the class consisting

of organic natural and synthetic fibers and having a diameter in the range of from about 1μ to 50μ and a length in the range of from about 1mm to 5cm, said fibrous filaments each having a void space therearound and being present in an amount of about 2 to 80 parts by weight per 100 parts by weight of said base material, and a substantially spherical particulate pigment



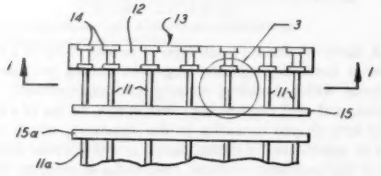
having a diameter in the range of from about 100Å to 50μ, the particles of pigment each having a void space therearound and being present in an amount of about 5 to 40 parts by weight per 100 parts by weight of said base material, therein at least some of the void spaces formed around said pigment connect with at least some of the void spaces around said fibrous filaments.

4,113,909

METHOD FOR FORMING EXPANDED PANELS FROM THERMOFORMABLE MATERIAL AND THE RESULTANT PRODUCT

Donald R. Beasley, Bronxville, N.Y., assignor to Norfield Corporation, Danbury, Conn.

Filed Jan. 27, 1977, Ser. No. 763,097
Int. Cl.² B29C *17/02*; B32B *3/12*
U.S. Cl. 428—116 **4 Claims**



1. In a process for expanding the cross-section of a blank of thermoformable material while in a thermoformable state by steps comprising positioning the material between two mold plates while said material in a thermoformable state and heated to a temperature at which it will adhesively bond to the mold plates, adhesively bonding the material by hot tack adhesion to each of the two mold plates, pulling the mold plates apart while the material is so bonded and in a thermoformable state and cooling the expanded material to a temperature below the heat distortion point of the material, the improvement comprising providing supports for each of the two mold plates being supported only on a plurality of elongated studs arranged in rows and columns distributed over the area of each mold plate and essentially perpendicular thereto whereby bending of said plates is avoided, the studs having a length such as to satisfy the following equation: $D = C - \sqrt{C^2 - X^2}$ where D equals one-half the maximum deviation permissible in panel thickness, C the length of the studs and X the amount of thermal expansion in one half of the mold based on the mold material used and the temperature differential to be employed.

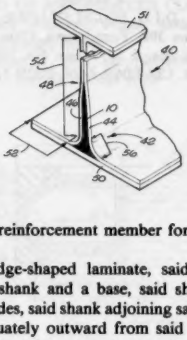
3. The product produced by the process of claim **1.**

4,113,910

COMPOSITE LOAD COUPLER FOR REINFORCING COMPOSITE STRUCTURAL JOINTS

Morris S. Loyd, Northridge, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 27, 1977, Ser. No. 791,360
Int. Cl.² B64C *1/00*; F16B *2/14*
U.S. Cl. 428—162 **29 Claims**



1. A composite reinforcement member for structural joints comprising:

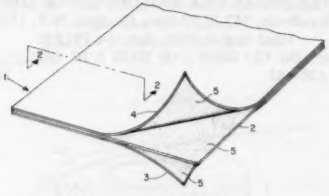
a generally wedge-shaped laminate, said laminate being defined by a shank and a base, said shank having two longitudinal sides, said shank adjoining said base, said base extending arcuately outward from said shank, said base being tapered in thickness as it extends from said shank, said laminate having a plurality of fiber composite sheets of uniform size and shape, said sheets being adhesively bonded together, said sheets being arranged such that the fibers substantially distribute a tension load on said base as a shear load along said longitudinal sides of said shank.

4,113,911

QUIET, STRONG CLOTH-LIKE TISSUE LAMINATE

Larry L. LaFitte, Memphis, Tenn., and James B. Camden, Cincinnati, Ohio, assignors to The Buckeye Cellulose Corporation, Cincinnati, Ohio

Continuation of Ser. No. 528,611, Dec. 2, 1974, abandoned. This application Nov. 15, 1976, Ser. No. 741,640
Int. Cl.² B32B *7/00*
U.S. Cl. 428—284 **9 Claims**



1. The quiet, strong clothlike tissue laminate comprising a central layer of continuous filament only lightly bonded or unbonded spunbond nonwoven material, having a basis weight of about 0.3 to about 0.8 oz. per sq. yd., wherein said central layer is impregnated with a liquid emulsion of about 50 to about 120%, based on the fibrous weight of said central layer, of soft, tacky latex binder solids having a glass transition temperature of about 10° C. to about −80° C. and a tack test of about 2 pounds to about 40 pounds, which central layer of continuous filament spunbond nonwoven material is wet combined with, and at low combining pressure joined to, with substantial penetration of said latex binder solids into, between at least two absorbent tissue facing layers each having a basis weight of about 7 to about 18 lbs. per 3000 sq. ft. and subsequently dried.

4,113,912
HYDROPHILIC POROUS STRUCTURES AND PROCESS FOR PRODUCTION THEREOF

Koichi Okita, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 10, 1977, Ser. No. 823,474

Claims priority, application Japan, Aug. 10, 1976, 51/95582; Jun. 21, 1977, 52/74069

Int. Cl.[2] D04H *1/58;* B32B *27/04*

U.S. Cl. 428—290 **31 Claims**

1. A hydrophilic porous structure comprising a porous fluorocarbon resin structure with the pores of the fluorocarbon resin structure containing at least one water-isolubilized water-soluble polymer.

21. The structure of claim 1, wherein the porous fluorocarbon resin structure is a porous polytetrafluoroethylene structure.

23. The structure of claim 21, wherein the porous polytetrafluoroethylene has a microstructure containing nodes connected to one another by fibers.

4,113,913
FOAMED CEMENTITIOUS MATERIAL AND COMPOSITE

Leonard H. Smiley, Jenkintown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed May 13, 1976, Ser. No. 686,193

Int. Cl.[2] C04B *15/02*

U.S. Cl. 428—310 **4 Claims**

1. A cementitious composite comprising (a) a veneer of unfoamed cementitious material comprising Portland cement and, on a weight basis per part of said cement, 0.001 to 2 parts film-forming and water-resistant, and alkali-stable emulsion polymer, 0.001 to 0.4 parts pigment, 0.025 to 2.4 parts sand, and 0.025 to 2 parts water on (b) a substrate of a foamed cementitious material comprising portland cement and about 0.001 to 2 parts by weight film-forming and water-resistant, and alkali-stable emulsion polymer per part by weight portland cement.

4,113,914
PROCESS FOR APPLYING SEALANT COMPOSITION

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 9, 1977, Ser. No. 794,893

Int. Cl.[2] C08L *91/08*

U.S. Cl. 428—355 **8 Claims**

1. A process for sealing an area between two surfaces comprising applying a composition to at least a portion of said area, said composition comprising

a. 100 parts by weight of a block copolymer selected from the group consisting of

aa. polymers of the structural formula

$$(S—D)_mY,$$

bb. polymers of the structural formula

$$(S—D')_nY, \text{ and}$$

cc. polymers of the structural formula

$$S—D'—S,$$

wherein

S is a block of polymerized styrene,

D is a block of polymerized butadiene or isoprene,

D' is a hydrogenated block of polymerized butadiene or isoprene,

Y is a residue of a polyfunctional coupling agent or of a polyfunctional initiating agent,

m is an integer of above 2,

n is an integer of 2 or more,

the block copolymer having a weight average molecular weight of

aa. 200,000 to 750,000 for polymers aa.,

bb. 50,000 to 500,000 for polymers bb. and cc.,

b. 1 to 30 parts by weight of an epoxy resin,

c. 10 to 250 parts by weight of a modifying resin,

d. 25 to 250 parts by weight of a filler.

7. An article produced in accordance with the process of claim 1.

4,113,915
GLASS BEAD PRODUCT

Charles W. Schott, 175 Carmella Dr., McKeesport, Pa. 15131

Division of Ser. No. 515,191, Oct. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 291,262, Sep. 22, 1972, Pat. No. 3,856,899, which is a continuation-in-part of Ser. No. 35,962, May 11, 1970, Pat. No. 3,694,528. This application Apr. 27, 1976, Ser. No. 680,691

Int. Cl.[2] C03B *19/10*

U.S. Cl. 428—402 **3 Claims**

1. A glass generally spherical glass particle containing non-continuous integral crystalline matrix derived elements each one being at least partially enclosed within said glassy particle.

4,113,916
SHELL SAND WITH IMPROVED THERMAL SHOCK RESISTANCE

Robert Simpson Craig, Hoffman Estates, Ill., assignor to Acme Resin Corporation, Forest Park, Ill.

Continuation of Ser. No. 510,088, Sep. 27, 1974, abandoned. This application Jun. 9, 1976, Ser. No. 694,426

Int. Cl.[2] B32B *5/16*

U.S. Cl. 428—404 **11 Claims**

1. A resin coated sand comprising:

(a) particles of sand coated with from about 1 to about 8% by weight of the sand, of a phenol-formaldehyde novolak resin;

(b) a curing agent; and

(c) from about 2 to about 50%, based upon the weight of the phenol-formaldehyde novolak resin, of an epoxy and/or phenoxy resin.

4,113,917
POWDERY COATING COMPOSITION AND PROCESS FOR PREPARING THE SAME

Hideyoshi Tugukuni, Sakai, and Masafumi Kano, Nagaokakyo, both of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Division of Ser. No. 400,621, Sep. 25, 1973, Pat. No. 3,970,725. This application May 5, 1976, Ser. No. 683,508

Claims priority, application Japan, Sep. 26, 1972, 47-96541; Oct. 28, 1972, 47-108306

Int. Cl.[2] B32B *19/02, 19/04*

U.S. Cl. 428—407 **4 Claims**

1. A powdery coating composition comprising polymer particles having an average particle size within the range of 0.5 to 200μ and composed of, as a core component, a polymer having a softening point not exceeding 90° C. and selected from the group consisting of acrylic copolymers containing 5 to 60% by weight of units of a monomer whose homopolymer has a Tg lower than 0° C. and, as an outer component, a polymer having an softening point of at least 100° C. and being selected from the group consisting of ethyl cellulose and hydroxyethyl cellulose wherein the weight ratio of the core component to the outer component is within the range from 50/50 to 100/1 and said outer component covers said core component.

4,113,918
UNDERCOAT-APPLIED PLASTIC FILMS

Motoo Kogure; Mamoru Komiya; Masaharu Oishi, and Masaru Kanbe, all of Sagamihara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

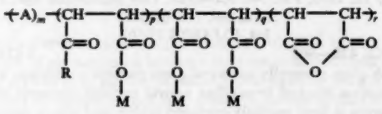
Continuation of Ser. No. 336,881, Feb. 28, 1973. This application Apr. 15, 1976, Ser. No. 677,266

Claims priority, application Japan, Mar. 3, 1972, 47-21534; Apr. 24, 1972, 47-40381

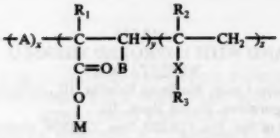
Int. Cl.[2] B32B 27/36; G03C 1/78

U.S. Cl. 428—412 18 Claims

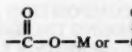
1. An undercoat-applied plastic film substrate selected from the group consisting of polyester, polyether, polycarbonate and polystyrene film substrates and an undercoat layer on at least one surface of the plastic film substrate, said undercoat layer being formed by treating the surface with a solution or dispersion containing a compound represented by the following general formula:



or

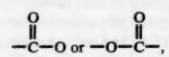


wherein A is a vinyl monomer selected from a group consisting of styrene; styrene substituted by a nitro group, fluorine, chlorine, bromine, chloromethyl or lower alkyl; vinyl methyl ether; vinyl ethyl ether; vinyl chloromethyl ether; vinyl acetate; vinyl chloroacetate; vinyl propionate; acrylic or methacrylic acids; itaconic acids; alkyl acrylates and methacrylates having 1 to 5 carbon atoms in the alkyl moiety, which alkyl group is unsubstituted or substituted by chlorine or phenyl; phenyl acrylate and phenyl methacrylate; acrylonitrile; vinyl chloride; vinylidene chloride; ehtylene, acrylamide; acrylamide substituted by an alkyl group of 1 to 5 carbon atoms, chlorine or phenyl; vinyl alcohol; glycidyl acrylate; and acrolein; B is hydrogen,



M is hydrogen, an alkali metal, or ammonium cation, at least 10% of said M's being alkali cation; R is —O—R′ or

in which R′ is alkyl, aralkyl, or aryl; and R″ is an atomic group necessary for completing a heterocyclic ring selected from the group consisting of aziridine, pyrrole, pyrrolidine, pyrazole, imidazole, imidazoline, triazole, piperidine, piperazine, oxazine, morpholine and thiazine, R_1 and R_2 are individually hydrogen or lower alkyl, X is



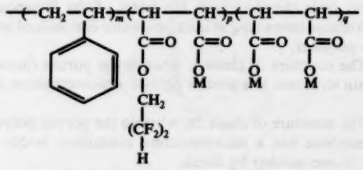
R_3 is a halogenoalkyl or halogenoalkoxyalkyl group, m is 40 to 60, p is 0 to 60, q is 0 to 50, r is 0 to 5, x is 0 to 70, y is 20 to 80 and z is 0 to 80 wherein

$$m + p + q + r = 100$$

$$x + y + z = 100$$

and a solvent or swelling agent for said plastic film substrate selected from resorcinol, orcinol, a β-resorcylic acid, pyrogallol, catechol, hydroquinone, α-naphthol, phenol, cresol, p-chlorophenol, salicylic acid, nitrobenzoic acid, toluene, acetophenone and anisole.

9. A plastic film according to claim 1 wherein said compound is



4,113,919
PROCESS FOR IN SITU FORMATION OF A TREE-DERIVED RESINOUS ADHESIVE COMPOSITION

Seymour Hartman, Mahopac, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 633,235, Nov. 19, 1975, Pat. No. 4,045,386, which is a continuation-in-part of Ser. No. 574,036, May 2, 1975, abandoned. This application Apr. 27, 1977, Ser. No. 791,565

Int. Cl.[2] B32B 21/08, 27/42; C08L 1/02

U.S. Cl. 428—529 4 Claims

1. A process for the in situ formation of a tree-derived resinous adhesive composition, which comprises admixing

(A) a finely-divided, alkali-treated wood bark premix, tannin and aldehyde, said alkali-treated wood bark premix being a mixture of finely divided bark particles, alkali and water, which has been neutralized with acid prior to the addition of the tannin and aldehyde to a pH in the range of approximately 5.5 to 7 pH, without an application of external heat to form an adhesive precursor admixture, applying said precursor admixture to wood members to be adhesively bonded, and subjecting said precursor composition and said wood members to temperature and pressure conditions effective to cause the formation of an alkali bark-extended tannin-aldehyde resin bond between said wood members.

4,113,920
COMPOSITE WEAR-RESISTANT ALLOY, AND TOOLS FROM SAME

Eugene L. Helton, Peoria; Preston L. Gale, Chillicothe; Lowell J. Moen, Peoria, all of Ill.; Robert C. Mueller, Mentor, Ohio; Walker L. Pierce, Jr., and Henry J. Vermillion, Jr., both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

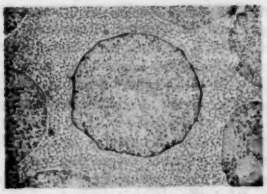
Division of Ser. No. 466,142, May 2, 1974, Pat. No. 4,011,051. This application Oct. 18, 1976, Ser. No. 733,562

Int. Cl.[2] B22F 5/00

U.S. Cl. 428—565 6 Claims

1. A ground engaging tool having increased resistance to wear including a contact section for engaging the ground and at least a portion of said section reinforced with a wear resistant composite alloy, said wear resistant composite alloy comprising cast spheroidal particles of a first alloy embedded in a matrix of a second tough ductile alloy in which said first alloy

is soluble with difficulty, and wherein the first alloy comprises from about 25–70% by weight chromium, from about 6–12%



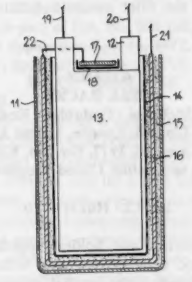
by weight boron, from about 0 to about 2% by weight carbon, and iron is the balance.

4,113,921

SECONDARY CELLS

Jonathan R. Goldstein, 51 Hashachal St., and Yitzhak Klein, 1 Chatam Sofer St., both of Jerusalem, Israel

Filed Jul. 5, 1977, Ser. No. 812,672
Claims priority, application Israel, Jul. 12, 1976, 50024
Int. Cl.² H01M *10/34*
U.S. Cl. 429—27 **11 Claims**



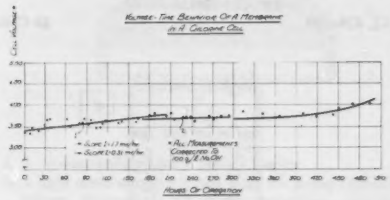
1. A secondary cell comprising zinc electrodes and an auxiliary electrode having a surface of an electrocatalyst having a low overvoltage for hydrogen evolution which is resistant to deposition of zinc thereon, and means for connecting said auxiliary electrode to the negative electrodes during charging, said auxiliary electrode acting to take up the excessive current at the negative electrodes over that of the positive electrodes during charging thus eliminating or substantially reducing the shape-change phenomena of the negative electrodes.

4,113,922

TRIFLUOROSTYRENE SULFONIC ACID MEMBRANES

Vincent F. D'Agostino, Huntington Station; Joseph Y. Lee, Lake Grove, and Edward H. Cook, Jr., Lewiston, all of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls and RAI Research Corporation, Hauppauge, both of, N.Y.

Division of Ser. No. 741,163, Nov. 11, 1976, which is a division of Ser. No. 535,636, Dec. 23, 1974, Pat. No. 4,012,303. This application Nov. 10, 1977, Ser. No. 850,194
Int. Cl.² H01M *8/10*
U.S. Cl. 429—33 **5 Claims**



1. In a fuel cell, the improvement comprising a separator having:

a. an inert polymeric base film; and

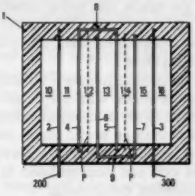
b. sulfonated α, β, β-trifluorostyrene irradiation grafted on said film.

4,113,923

FUEL CELL INCLUDING AT LEAST ONE IMPROVED ELEMENT

Jacques Cheron, Maisons-Lafitte, France, assignor to Institut Francais du Petrole, France

Filed Sep. 29, 1976, Ser. No. 727,804
Claims priority, application France, Oct. 9, 1975, 75 31215
Int. Cl.² H01M *4/70*
U.S. Cl. 429—36 **16 Claims**



1. A fuel cell including at least one fuel cell element comprising a fuel cell housing, two terminal electrodes within said housing provided with external electrical connection means and intermediate electrodes between said terminal electrodes, said electrodes being mounted in the walls of said housing and separated from one another, said electrodes, together with the walls of said housing delimiting electrolyte chambers, fuel chambers and chambers containing a combustion sustaining fluid, wherein said intermediate electrodes are formed by at least one pair of U- or V-shaped members electrically insulated from each other, each exposed face of said U- or V-shaped members being coated with a catalyst each member being so positioned that one of the members of said pair has one arm inserted between the opposite arms of the other member thereof, said arms constituting the intermediate electrodes and delimiting between each other a central chamber and two adjacent chambers on both sides of said central chamber, and wherein said central chamber and said adjacent chambers delimited by the terminal electrodes and the intermediate electrodes adjacent to said terminal electrodes from electrolyte chambers, each of which is located between a fuel chamber and a chamber containing the combustionsustaining fluid,

whereby each catalyst-coated face of said U- or V-shaped members is in contact with fuel or combustion sustaining fluid, respectively.

4,113,924

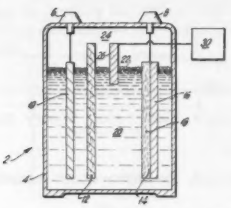
ZINC-HALOGEN COMPOUND ELECTROCHEMICAL CELL HAVING AN AUXILIARY ELECTRODE AND METHOD

Edward Kantner, E. Brunswick, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed May 26, 1977, Ser. No. 800,786

Int. Cl.[2] H01M *10/44*

U.S. Cl. 429—50 **18 Claims**



1. An electrochemical cell, comprising, in a sealed configuration:

(a) an anode having a zinc anode-active material;

(b) a cathode having a halogen compound cathode-active material;

(c) an acidic liquid electrolyte and a gas space above the electrolyte, wherein hydrogen gas is capable of being generated in said cell and of accumulating in said gas space; and

(d) an auxiliary electrode made of a carbon-containing hydrophobic material, and having a cathodic potential, said auxiliary electrode being positioned in said cell so as to be partially located in said liquid electrolyte and partially located in said gas space, and being capable of converting said hydrogen gas to its ionic state via the formation of an ionic compound whereby the ionic compound is dissolved in said liquid electrolyte.

10. A method of retarding pressure buildup in an electrochemical cell having an anode with a zinc anode-active material, having a cathode with a halogen compound cathode-active material, and having an acidic liquid electrolyte with a gas space above said liquid electrolyte, wherein hydrogen gas is generated in said cell and accumulated in said gas space causing a pressure buildup, comprising:

creating a cathodic potential at an auxiliary electrode so as to convert said hydrogen gas to its ionic state via the formation of an ionic compound whereby the ionic compound is dissolved in said liquid electrolyte, said auxiliary electrode being made of a carbon-containing hydrophobic material and being positioned in said cell so as to be partially located in said liquid electrolyte and partially located in said gas space.

4,113,925

BATTERY FILLING AND VENTING STRUCTURE

Werner Köhler, Stuttgart; Gerhard Drücker, Neuhausen; Ulrich Kiess, Esslingen-Liebersbronn, and Manfred Stotz, Sersheim, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

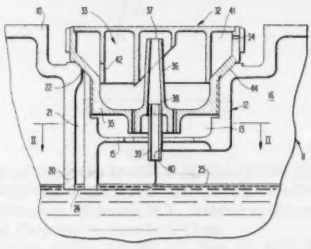
Filed Aug. 25, 1976, Ser. No. 717,682

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1975, 2537848

Int. Cl.[2] H01M *2/12*

U.S. Cl. 429—78 **25 Claims**

1. A battery comprising at least one cell defining a battery interior space and at least one filler means having an opening terminating in the atmosphere for introducing electrolyte liquid into said interior space, the battery interior space being connected with the atmosphere by way of at least one filler venting connecting means having an opening terminating in the atmosphere and an opening terminating in the battery interior space which is geodetically located approximately at the height of the intended liquid level within said battery interior space, a fill-in chamber means located between the opening of said filler means terminating in the atmosphere and the interior space of the battery, and chamber connecting means connecting the fill-in chamber means with the battery interior space, said chamber connecting means including at least one opening of a narrow capillary free flow cross section terminating in the battery interior space and geodetically arranged above the intended liquid level, the free flow cross section of the at least one opening being such that a liquid said means closing off the at least one opening in a substantially gas



tight manner will form under the influence of a capillary effect and the excess pressure which will establish itself during a fill-in operation in the battery interior space above the liquid level, when the liquid has entered into the opening of the venting connecting means terminating in the battery interior space, a detachable closure means for closing off the opening of the filler means terminating in the atmosphere, the fill-in chamber means being provided with a pressure equalization opening that terminates in the battery interior space at a place geodetically above the intended liquid level, and the closure means being provided with a vent opening in continuous communication with the atmosphere, the pressure equalization opening being connected with the vent opening by a venting connection means when the closure means is in the closed position and said filler venting connecting means being positioned outside of the filler means and outside of the fill-in chamber means.

4,113,926

CELL RACKS

Roderick Julian McBrien, Tonbridge, England, assignor to Chloride Group Limited, London, United Kingdom

Filed Aug. 18, 1977, Ser. No. 825,718

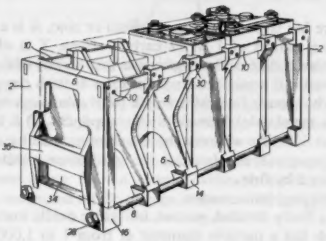
Claims priority, application United Kingdom, Aug. 20, 1976, 34842/76

Int. Cl.[2] H01M *2/10*

U.S. Cl. 429—99 **11 Claims**

1. A rack supporting and holding together two or more rectangular electric cells side by side with their end walls coplanar and their side walls parallel, comprising two generally planar rack elements forming the ends of the rack and at least one additional generally planar intermediate rack element of spider form having radiating arms, the rack elements being arranged in spaced planes which in use will be parallel to the side walls of the cells with a cell between each neighbouring pair of rack elements, each rack element affording, in the region of each corner of each adjacent side wall, a vertical spacing surface lying flat against the side wall of each adjacent cell, and having a portion projecting beyond the side wall, each projecting portion adjacent a bottom corner affording a

horizontal supporting surface to engage the bottom of the cell, and each projecting portion adjacent an upper corner and/or a lower corner affording a vertical locating surface to engage an end wall of the cell to restrain lateral movement parallel to the



side walls, and tie members extending horizontally along the end walls, engaging the projection portions of the rack elements and arranged to connect the rack elements together to hold the cells and rack elements together in a stack.

4,113,927

BATTERY SEPARATOR HAVING COATED RIBS

Peter E. Johnson, and Bob G. Rowland, both of Corvallis, Oreg., assignors to Evans Products Company, Portland, Oreg.

Filed Aug. 13, 1975, Ser. No. 604,350
Int. Cl.[2] H01M *2/18*
U.S. Cl. 429—143 **8 Claims**

1. In a battery separator manufactured by sintering a heat-fusible resin and having ribs on at least one side thereof, the improvement comprising a coating on said ribs, said coating consisting essentially of a low-density polyethylene wax having a softening point between about 70° C. and about 130° C.

4,113,928

METHOD OF PREPARING DENSE, HIGH STRENGTH, AND ELECTRICALLY CONDUCTIVE CERAMICS CONTAINING β″-ALUMINA

Anil V. Virkar; Mark L. Miller; Ivan B. Cutler, and Ronald S. Gordon, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Continuation-in-part of Ser. No. 658,160, Feb. 17, 1976, abandoned. This application Apr. 18, 1977, Ser. No. 788,572
Claims priority, application Belgium, Feb. 17, 1977, 17952
Int. Cl.[2] H01M *6/18*
U.S. Cl. 429—193 **26 Claims**

1. A method for preparing a dense, strong polycrystalline β″-alumina-containing ceramic body exhibiting (i) an electrical resistivity for sodium ion conduction at 300° C. of less than or equal to about 9 ohm-cm, and (ii) a fine, uniform microstructure and resultant fracture strength comparable to that achieved by hot pressing techniques, comprising:

(A) preparing a powder mixture comprising aluminum oxide, sodium oxide and lithium oxide in stoichiometric proportions required to produce β″-alumina upon being heated to crystal forming temperatures, said lithium oxide being present in amounts ranging from about 0.1 to about 5 weight percent of the total of said mixture and being provided by a lithium aluminate compound having the formula $Li_2O{:}nAl_2O_3$ wherein n equals at least 5;

(B) green forming said preparing mixture to the desired shape; and

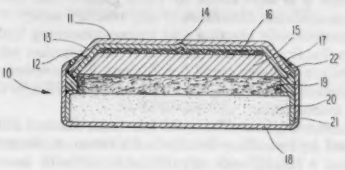
(C) sintering the green formed body at a temperature above about 1500° C. until desirable conversion to β″-alumina and near theoretical density for same are achieved.

4,113,929

NON-AQUEOUS PRIMARY BATTERY HAVING A PURE SILVER CHROMATE CATHODE

Nehemiah Margalit, Levittown, Pa., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Nov. 14, 1977, Ser. No. 851,414
Int. Cl.[2] H01M *6/14*
U.S. Cl. 429—194 **8 Claims**



1. A non-aqueous primary battery having

(a) a light metal anode selected from the group consisting of lithium, magnesium, aluminum, beryllium, calcium, sodium, and potassium;

(b) an electrolyte solution comprised of an organic solvent and a light inorganic salt dissolved therein;

(c) a separator; and

(d) a cathode consisting of silver chromate without binder or conductive additives.

4,113,930

HYDROGENATED 1,3-CYCLOHEXADIENE/1,3-BUTADIENE COPOLYMERS

George A. Moczygemba, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 2, 1976, Ser. No. 711,029
Int. Cl.[2] C08F *8/04*
U.S. Cl. 526—25 **13 Claims**

1. A hydrogenated copolymer of 1,3-cyclohexadiene having unusually high green tensile strength formed by (1) copolymerizing 1,3-cyclohexadiene and 1,3-butadiene in a weight ratio in the range of about 40/60 to about 60/40 under copolymerizing conditions in the presence of a catalyst mixture consisting of catalytic amounts of titanium tetrachloride and at least one cyclopolyolefin nickel complex of the formula

$$Ni(L)_n$$

wherein n is an integer of 1 to 4 and each ligand L is individually selected from the group consisting of cyclopolyolefin having 5 to 18 carbon atoms, 5 to 14 of which make up a cyclic ring containing at least two ethylenic groups and (2) hydrogenating at least about 98 percent of the unsaturation of the resulting copolymer under conditions sufficient to increase the green tensile strength of said copolymer.

4,113,931

PROCESS FOR THE CONTINUOUS PRODUCTION OF INDENE RESINS

Hans Spengler, Henrichenburg; Günter Bucksch, Duisburg, and Manfred Morgenstern, Castrop-Rauxel, all of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 488,092, Jul. 12, 1974, abandoned. This application Jul. 12, 1976, Ser. No. 704,600
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1973, 2335891
Int. Cl.[2] C08F *244/00*
U.S. Cl. 526—64 **33 Claims**

1. A continuous process for the production of an indene resin, said process comprising the following sequential steps:

(A) preheating an indene-containing hydrocarbon fraction to a reaction temperature of about 20° C. to about 180° C.;
(B) continuously feeding said preheated indene-containing hydrocarbon fraction and a boron trifluoride-containing catalyst into a reaction tube which is maintained at said reaction temperature, wherein said catalyst is in an amount between about 0.03 and about 0.4% by weight catalyst, related to the weight of said indene-containing fraction; and wherein said reaction tube has a length which is at least about 10^3 times greater than the major cross-sectional dimension of said reaction tube;
(C) continuously reacting said indene-containing hydrocarbon fraction and said catalyst in said reaction tube at a pressure between about 0 and about 8 atmospheres for a period of from about 3.84 min. to about 35.89 min. to form an indene resin;
(D) contacting said mixture of said resin, catalyst and unreacted hydrocarbon fraction with steam at about 0.5 to about 6 atmospheres of pressure in order to decompose said catalyst; and
(E) separating said indene resin from said decomposed catalyst and unreacted hydrocarbon fraction.

4,113,932

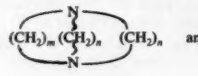
PROCESS FOR POLYMERIZING VINYL CHLORIDE MONOMER

Takeshi Sekihara; Tomoyuki Emura, and Masayuki Murashige, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Feb. 3, 1978, Ser. No. 874,748
Claims priority, application Japan, Feb. 17, 1977, 52-16834
Int. Cl.[2] C08F *14/06*
U.S. Cl. 526—74 **6 Claims**

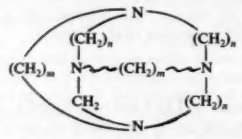
1. In a process for polymerizing vinyl chloride alone or a mixture of vinyl chloride as a main component and a monomer copolymerizable therewith in an aqueous medium, an improvement which comprises carrying out said polymerization in the presence of a polycyclic nitrogen-containing compound of the formula,

(1)



and/or

(2)



wherein m and n are each an integer of 1 to 3, the amount of said compound being 1 ppm to less than 100 ppm by weight based on said monomer or monomer mixture.

4,113,933

MANUFACTURE OF HOMOPOLYMERS AND COPOLYMERS OF α-MONOOLEFINS

Günther Schweier, Ludwigshafen; Erich Kolk, Bad Durkheim; Heinz Mueller-Tamm, Ludwigshafen; Hans Frielingsdorf, Bad Durkheim; Robert Bachl, Worms, and Wolfgang Gruber, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 27, 1977, Ser. No. 762,858
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1976, 2603919
Int. Cl.[2] C08F *4/02, 10/02*
U.S. Cl. 526—124 **18 Claims**

1. A process for the manufacture of homopolymers and copolymers of α-monoolefins of 2 to 6 carbon atoms by polymerizing the monomer or monomers at from 30° to 200° C and pressures of from 0.1 to 200 bars, using a Ziegler catalyst system comprising
(1) a titanium-containing catalyst component and
(2) a metal compound of the general formula

$$Me\ A_{m-n}X_n$$

where Me is aluminum, magnesium or zinc, A is a hydrocarbon radical of 1 to 12 carbon atoms, X is chlorine, bromine, iodine or hydrogen, m is the valency of the metal Me and n is a number from 0 to $m-1$, with the proviso that the atomic ratio of titanium from catalyst component (1) to metal (Me) from catalyst component (2) is from 1 : 0.1 to 1 : 500, wherein the titanium-containing catalyst component (1) employed is the solid-phase product (VI) obtained by first
(1.1) bringing into contact
(1.1.1) a finely divided, porous, inorganic oxidic material (I) which has a particle diameter of from 1 to 1,000 μm, a pore volume of from 0.3 to 3 cm^3/g and a surface area of from 100 to 1,000 m^2/g and which has the formula $SiO_2 \cdot aAl_2O_3$, where a is a numbe from 0 to 2 and
(1.1.2) an aluminum compound (II), dissolved in an organic solvent, the compound having the general formula

$$Al\ B_{3-p}Y_p$$

where B is a hydrocarbon radical of 1 to 12 carbon atoms, Y is chlorine, bromine, iodine, hydrogen or OR, R is a hydrocarbon radical of 1 to 12 carbon atoms and p is a number from 0 to 3 to form a solid-phase product (III), with the proviso that the weight ratio of inorganic oxidic material (I) employed to aluminum compound (II) employed is from 1 : 0.05 to 1 : 10, and then
(1.2) bringing into contact
(1.2.1) the solid-phase product (III) obtained from stage (1.1) and
(1.2.2) a solution (IV) obtained by bringing together (IV*a*) 100 parts by weight of an alcohol of the general formula

$$Z—OH$$

where Z is a saturated hydrocarbon radical of 1 to 8 carbon atoms, (IV*b*) from 0.01 to 6 parts by weight (calculated as titanium) of a titanium trihalide, where the halogen may be chlorine and/or bromine and (IV*c*) from 0.01 to 4 parts by weight (calculated as magnesium) of a magnesium compound which is soluble in the alcohol (IV*a*) to form a dispersion (V), with the proviso that the weight ratio of solid-phase product (III — calculated as inorganic oxidic material I) — to titanium in the titanium trihalide (IV*b*) is from 1 : 0.01 to 1 : 0.2 and the weight ratio of solid-phase product (III — calculated as inorganic oxidic material I) — to magnesium in the magnesium compound (IV*c*) is from 1 : 0.01 to 1 : 0.25, and evaporating the dispersion (V) at below 200° C, and above the melting point of the alcohol (IV*a*) used, the evaporation being substantially complete in about 1 to 10 hours, until it reaches a dry consistency, i.e. until the solid-phase product (VI) is formed, any residual alcohol being left in said solid-phase product (VI).

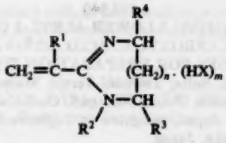
4,113,934

UNSATURATED IMIDAZOLINES

Hans Peter Panzer, Stamford; Michael Niall Desmond O'Connor, Norwalk, and Louis J. Baccei, Newington, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 467,331, May 6, 1974, Pat. No. 4,006,247.
This application Jul. 16, 1976, Ser. No. 706,087
Int. Cl.[2] C08F *26/06*
U.S. Cl. 526—258 **7 Claims**

1. A vinyl addition copolymer of (1) a monomer having the formula



wherein *n* and *m* are, individually, 0 or 1, X is an anion, R′ is hydrogen, methyl or phenyl and R^2, R^3 and R^4 are, individually, hydrogen, alkyl (C_1–C_4), aryl (C_6–C_{10}), aralkyl (C_7–C_{11}) or alkaryl (C_7–C_{11}) and (2) at least one monoethylenically unsaturated comonomer copolymerizable with (1) at a ratio of 96:4 to 4:96, respectively, the heterocyclic component of the copolymer being free of imino, carboxyl, ester and amide groups, unreacted nitrile groups and unreacted polyamine.

4,113,935
PROCESS FOR PRODUCING LOW SHRINKAGE FILM BANDS

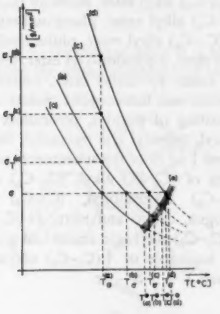
Heinz Schippers; Friedhelm Hensen, both of Remscheid; Gerhard Koslowski, Hückeswagen, and Dieter Czerwon, Hückeswagen-Weihagen, all of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Continuation of Ser. No. 476,052, Jun. 3, 1974, abandoned. This application Sep. 13, 1976, Ser. No. 722,558

Claims priority, application Fed. Rep. of Germany, Jun. 6, 1973, 2328639

Int. Cl.² C08F *10/06*; B29D *7/24*

U.S. Cl. 526—351 **8 Claims**



1. A multistage stretching process for producing monoaxially stretched film bands of a thermoplastic film-forming polypropylene polymer having a residual shrinkage of less than 2% at a test temperature of 132° C., said stretching being applied to the initially extruded, amorphous polymer film divided into a plurality of said film bands, which process comprises:

monoaxially stretching said film bands in a plurality of separate stages at a temperature above room temperature but below the crystalline melting point of the polymer;

raising the stretching temperature in going from one stretching stage to the next stage;

maintaining the stretching temperature in each stage at a high maximum value T^{Θ} corresponding to that which in itself would be sufficient to accomplish a single stage stretching at the total desired stretch ratio but at the same time limiting the stretching tension to a low value σ considerably below the stretching tension required at said temperature value T^{Θ} to produce the total desired stretch ratio, with the proviso that the first stage stretching is not more than one-third the total stretching;

adjusting the raised temperature in each succeeding stage to a new maximum value T^{Θ} corresponding to the higher temperature resistance of the film bands based upon their order of crystalline orientation;

and then heat stabilizing the stretched film bands after the final stretching stage by heating them at a temperature of between about 20° C. to 30° C. below the crystalline melting point of the polymer while the bands are relaxed sufficiently to permit shrinkage.

7. The polypropylene film band product obtained by the process of claim 1 having a tensile strength of at least 5 g/denier and a residual shrinkage value below 2%.

4,113,936
CROSS-LINKING OF CELLULOSE FIBERS IN GAS SUSPENSION

Claude H. Lesas, Colmar, and Michel Pierre, Mulhouse, both of France, assignors to S. A. Beghin-Say, Thumeries, France

Filed Oct. 13, 1976, Ser. No. 731,895

Claims priority, application France, Oct. 20, 1975, 75 31965

Int. Cl.² C08B *15/10*

U.S. Cl. 536—56 **9 Claims**

1. A process for treating cellulose fibers with formaldehyde comprising the steps of -

(1) spraying of formaldehyde as a mixture with hydrochloric acid and formic acid on individualized cellulose fibers;

(2) immediately after said spraying, introduction of said fibers which have the reagents of step (1) uniformly disposed thereon in an air stream having a temperature of from 60° to 250° C. and a velocity of from 1–20 m/sec during a curing-time period ranging between 1 and 10 seconds to effect a cross-linking reaction, and

(3) separating said fibers from said air stream.

4,113,937
STILBENE COMPOUNDS

Adolf Emil Siegrist, Basel, and Jean-Paul Pauchard, Fribourg, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

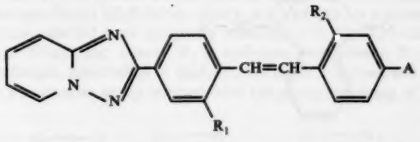
Filed Nov. 14, 1977, Ser. No. 850,861

Claims priority, application Luxembourg, Nov. 25, 1977, 77024

Int. Cl.² C09B *23/00*

U.S. Cl. 542—463 **9 Claims**

1. A stilbene compound of the formula



in which R_1 and R_2 independently of one another are hydrogen or chlorine and A is a mono-nuclear or poly-nuclear aromatic heterocyclic structure which contains oxygen atoms or oxygen and nitrogen atoms and is unsubstituted or substituted by non-chromophoric substituents.

4,113,938
STILBENE COMPOUNDS

Adolf Emil Siegrist, and Bernardo de Sousa, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

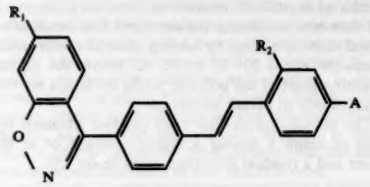
Filed Nov. 14, 1977, Ser. No. 851,040

Claims priority, application Luxembourg, Mar. 25, 1977, 77016

Int. Cl.² C09B *23/00*

U.S. Cl. 542—464 **10 Claims**

1. A stilbene compound of the formula



in which R_1 and R_2 independently of one another are hydrogen or chlorine and A is a mono-nuclear or poly-nuclear aromatic heterocyclic structure which contains oxygen atoms or oxygen and nitrogen atoms and is unsubstituted or substituted by non-chromophoric substituents.

4,113,939

N',N'-DISUBSTITUTED 2,1,3-BENZOTHIADIAZIN-(4)-ONE-2,2-DIOXIDES

Adolf Fischer, deceased, late of Mutterstadt, Fed. Rep. of Germany (by Caecilia Emma Fischer, heiress-at-law), and Gerhard Hamprecht, Mannheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

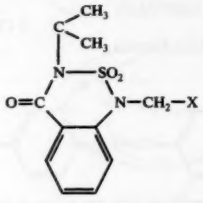
Filed Nov. 28, 1975, Ser. No. 636,162

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1974, 2458343

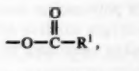
Int. Cl.[2] C07D *285/16*

U.S. Cl. 544—11 **9 Claims**

1. A substituted 2,1,3-benzothiadiazin-(4)-one-2,2-dioxide of the formula



where X denotes halogen or a



—O—R^2, —SR^3, or 2,4-dinitro-6-bromoanilino, o-cyanoanilino, o-nitroanilino, o-bromo-p-nitroanilino, and N-methyl-(o-bromo-p-nitroanilino), R^1 denoting alkyl, alkenyl, alkynyl, alkoxyalkyl, haloalkyl, cycloalkyl, aralkyl, or aryl, R^2 denoting O,O-dialkylthiophosphoro, O,S-dialkylphosphoro, S,S-dialkylphosphoro, O,O-dialkylthiophosphoro, O,S-dialkylthiophosphoro, S,S-dialkylthiophosphoro, aralkyl, aryl, or phenyl substituted by chlorine, nitro, lower alkyl, lower alkoxy, lower alkoxycarbonylamino or diloweralkylureido and R^3 having the same meanings as R^1 and additionally denoting O,O-dialkylthiophosphoro, O,S-dialkylthiophosphoro, S,S-dialkylthiophosphoro, O,O-dialkylphosphoro, O,S-dialkylphosphoro and S,S-dialkylphosphoro.

4,113,940

7-AMINO 2-LOWER ALKYL-2 OR 3-CEPHEM-4-CARBOXYLIC ACID DERIVATIVES AND PROCESSES FOR PREPARATION THEREOF

Takashi Kamiya, Suita; Tsutomu Teraji; Masashi Hashimoto, both of Toyonaka; Osamu Nakaguti, Osaka, and Teruo Oku, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

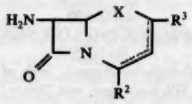
Continuation-in-part of Ser. No. 451,159, Mar. 14, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 640,910

Claims priority, application Japan, Mar. 15, 1973, 48-30718; Mar. 15, 1973, 48-30719; Mar. 15, 1973, 48-30720; Aug. 2, 1973, 48-87852; Aug. 2, 1973, 48-87853; United Kingdom, Oct. 3, 1975, 40677/75

Int. Cl.[2] C07D *501/14, 501/16, 501/60*; A61K *31/545*

U.S. Cl. 544—16 **5 Claims**

1. A compound of the general formula:



wherein R^2 is carboxy or a protected carboxy selected from the group consisting of tri(C_1–C_6) alkylsilyl ester, (C_1–C_{16}) alkyl ester, (C_2–C_6) alkenyl ester, (C_2–C_6) alkynyl ester, (C_3–C_8) cycloalkyl ester, (C_1–C_6) alkoxy (C_1–C_6) alkyl ester, (C_1–C_6) alkylthio (C_1–C_6) alkyl ester, di(C_1–C_6) alkylamino ester, (C_1–C_6) alkylideneamino ester, (C_1–C_6) alkylsulfenyl (C_1–C_6) alkyl ester, (C_1–C_6) alkanoyloxy (C_1–C_6) alkyl ester, phenyl ester, xylyl ester, naphthyl ester, indanyl ester, dihydroanthryl ester, phenyl (C_1–C_6) alkyl ester, phenoxy (C_1–C_6) alkyl ester, phenylthio (C_1–C_6) alkyl ester, phenylsulfenyl (C_1–C_6) alkyl ester, benzoyl (C_1–C_6) alkyl ester, phthalimido ester, pyridyl ester, piperidino ester, 2-pyridon-1-yl ester, tetrahydropyranyl ester, quinolyl ester, pyrazolyl ester, heterocyclic (C_1–C_6) alkyl ester wherein said heterocyclic moiety is selected from the group consisting of pyridyl, piperidino, 2-pyridon-1-yl, tetrahydropyranyl, quinolyl and pyrazolyl, the above recited ester having from 1 to 10 of the substituents selected from the group consisting of (C_1–C_6) alkyl, (C_1–C_6) alkoxy, (C_1–C_6) alkylthio, (C_1–C_6) alkylsulfinyl, (C_1–C_6) alkanesulfonyl, phenylazo, halogen, cyano and nitro; N-(C_1–C_6) alkyl acid amide, N,N-di(C_1–C_6) alkyl acid amide and acid amide formed with pyrazole, imidazole or 4-(C_1–C_6) alkylimidazole; R^3 is (C_1–C_6) alkyl, and X is —S— or

or a pharmaceutically acceptable salt thereof.

4,113,941

PROCESS FOR PURIFYING PRODUCTS OBTAINED FROM ENZYMATIC CLEAVAGE OF BETA-LACTAM ANTIBIOTICS

Fritz Hüper, and Helmut Oberheiden, both of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 4, 1976, Ser. No. 692,876

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1975, 2528622

Int. Cl.[2] C07D *501/12*

U.S. Cl. 544—20 **15 Claims**

1. A process for purifying a liquid reaction mixture obtained from the enzymatic cleavage of amido side chains from β-lactam antibiotics, said reaction mixture including the β-lactam antibiotic freed of said side chain, which comprises contacting

the reaction mixture with an anion exchange resin, and separating the purified liquid from the resin carrying the impurities.

4,113,942
4-(TETRAZOL-5-YL)-Δ^3-CEPHEM COMPOUNDS

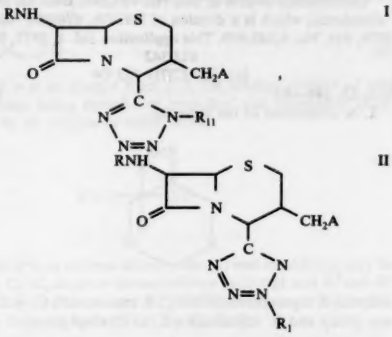
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 658,303, Feb. 17, 1976, Pat. No. 4,045,436, which is a division of Ser. No. 508,634, Sep. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Apr. 27, 1977, Ser. No. 791,537

Int. Cl.[2] C07D *501/18, 501/36*

U.S. Cl. 544—23 **10 Claims**

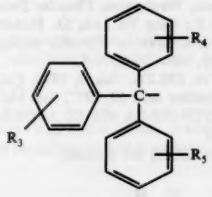
1. A compound selected from the group consisting of



I

II

and the acid addition salts thereof when R is hydrogen, said R being selected from the group consisting of hydrogen and

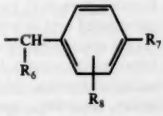


wherein R_3, R_4 and R_5 are each selected from the group consisting of hydrogen, chloro, bromo, fluoro, methyl, methoxy and phenyl;

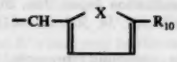
A being selected from the group consisting of 1-methyl5-tetrazolylthio and 2-methyl-1,3,4-thiadiazolyl-5-thio;

R_1 being selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, and phthalidyl;

and R_{11} being selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, phthalidyl,



wherein R_6 is selected from the group consisting of alkyl having from one to three carbon atoms and phenyl and R_7 is selected from the group consisting of hydroxy, methoxy, alkanoyloxy having two to four carbon atoms, and benzyloxy and R_8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



wherein R_9 and R_{10} are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

4,113,943
7β-[(2-AMINO-1,2-DIOXOETHYL)AMINO]ACYL CEPHALOSPORINS

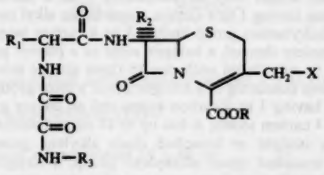
Uwe D. Treuner, and Hermann Breuer, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 10, 1977, Ser. No. 776,400

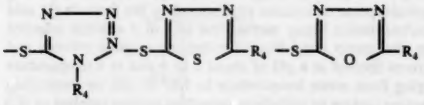
Int. Cl.[2] C07D *501/36*

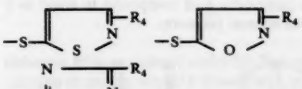
U.S. Cl. 544—26 **12 Claims**

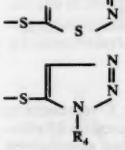
1. A compound of the formula



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl, aluminum, alkali metal, alkaline earth metal phenyl-lower alkylamine, N-N-dibenzylethylenediamine, lower alkyl amines, triethyl amine, or N-lower alkylpiperidine; R_1 is phenyl, phenyl-lower alkyl, substituted phenyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl, lower alkoxy, and hydroxy, or a heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl and 3-furyl; R_2 is hydrogen or methoxy; R_3 is hydrogen, lower alkyl or cycloalkyl of up to 7 carbons; and X is a heterothio group selected from the group consisting of







and

and R_4 is hydrogen or lower alkyl.

4,113,944

CEPHALOSPORIN-TYPE ANTIBIOTICS AND PROCESS FOR PRODUCING THE SAME

Fumio Kai, Fujisawa; Toshinori Saito, Yokohama; Shigeo Seki, and Toyoaki Kawasaki, both of Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

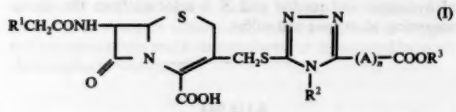
Filed Jun. 19, 1975, Ser. No. 588,555

Claims priority, application Japan, Jun. 20, 1974, 49/69641

Int. Cl.[2] C07D *501/54, 501/56;* **A61K** *31/545*

U.S. Cl. 544—27 **25 Claims**

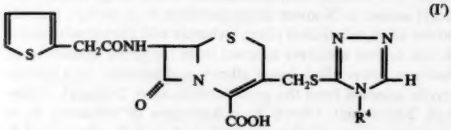
1. A cephalosporin compound represented by the formula (I)



(I)

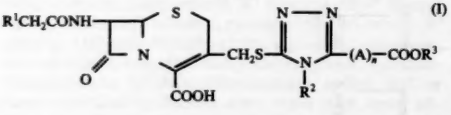
wherein R^1 represents a phenyl group, a 2-thienyl group or a phenoxy group; R^2 represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms which may be substituted with a phenyl group, an alkoxy group having 1 to 4 carbon atoms or a halogen atom, or a phenyl group which may be substituted with one or two groups selected from the group consisting of a halogen atom, a nitro group, an alkyl group having 1 to 4 carbon atoms and an alkoxy group having 1 to 4 carbon atoms; R^3 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms which may be substituted with a monoalkylamino group having 1 to 4 carbon atoms in the alkyl moiety thereof, a dialkylamino group having 1 to 4 carbon atoms in each alkyl moiety thereof, a halogen atom or a phenyl group which may be substituted with one to three groups selected from the group consisting of a halogen atom, a nitro group, an alkyl group having 1 to 4 carbon atoms and an alkoxy group having 1 to 4 carbon atoms; A has up to 15 carbon atoms and represents a straight or branched chain alkylene group, a straight or branched chain alkenylene group, a straight or branched chain alkadienylene group or a phenylene group, and n is 0 or 1; or the salt thereof.

23. A process for preparing a cephalosporin compound represented by the formula (I')



(I')

wherein R^4 represents a straight or branched chain alkyl group having 1 to 4 carbon atoms, which comprises decarboxylating a cephalosporin compound represented by the formula (I), said decarboxylation being carried out (A) in a solvent selected from the group consisting of water, an organic solvent and mixtures thereof at a pH of about 1 to 6 and at a temperature ranging from room temperature to 100° C, (B) by employing an active carbon or palladium-on-active carbon catalyst or (C) by allowing the free carboxylic acid compound to stand as a solid under reduced or normal pressure,



(I)

wherein n is 0; R^1 represents a 2-thienyl group; R^2 represents an alkyl group having 1 to 4 carbon atoms; R^3 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms which may be substituted with a monoalkylamino group having 1 to 4 carbon atoms in the alkyl moiety thereof, a dialkylamino group having 1 to 4 carbon atoms in each alkyl moiety thereof, a halogen atom or a phenyl group which may be substituted with one to three groups selected from the group consisting of a halogen atom, a nitro group, an alkyl group having 1 to 4 carbon atoms and an alkoxy group having 1 to 4 carbon atoms; and A represents a straight or branched chain alkylene group, a straight or branched chain alkenylene group, a straight chain or branched chain alkadienylene group or a phenylene group.

4,113,945

NOVEL CATALYST SYSTEM FOR TRIMERIZATION OF ORGANIC ISOCYANATES

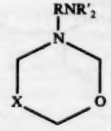
William J. Kauffman, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation-in-part of Ser. No. 750,246, Dec. 13, 1976, abandoned, which is a division of Ser. No. 670,881, Mar. 26, 1976, Pat. No. 4,025,469. This application Jul. 1, 1977, Ser. No. 812,342

Int. Cl.[2] C07D *273/04*

U.S. Cl. 544—67 **1 Claim**

1. A compound of the formula:



wherein X represents $N(RNR'_2)$, R represents a C_2 to C_4 alkylene group and R' represents a C_1 to C_5 alkyl group.

4,113,946

$\Delta^{2,3}$-1,4-MORPHOLINE-2-CARBOXYLIC ACID DERIVATIVES AS ANTIBACTERIAL AGENTS

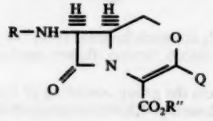
Bernard R. Belleau, Westmount, Canada; Terrence W. Doyle, Fayetteville, N.Y.; Bing Yu Luh, St. Hubert, and Terry T. Conway, Brossard, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 538,271, Jan. 2, 1975, Pat. No. 4,012,383. This application Jan. 19, 1977, Ser. No. 760,620

Int. Cl.[2] C07D *265/36, 498/02;* **A01N** *9/00, 9/22*

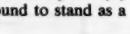
U.S. Cl. 544—105 **78 Claims**

1. A compound having the formula



I

wherein R is an acyl group of the formula



(i)

wherein R^a is (a) aryl selected from the group consisting of phenyl, 2-thienyl, 3-thienyl, furyl, 4-isoxazolyl, pyridyl, tetrazolyl, sydnone-3 or -4, imidazolyl, naphthoyl, quinoxalinyl, triazolyl, isothiazolyl, thiadiazolyl, thiazolyl, oxazolyl, oxadiazolyl, pyrazolyl, furazan, pyrazinyl, pyrimidinyl, pyridazinyl and triazinyl; (b) substituted aryl in which the aryl groups defined above under (a) are substituted by one or more chloro, bromo, iodo, fluoro, nitro, amino, cyano, (lower)alkanoyloxy, (lower)alkanoyl, (lower)alkoxyamino, (lower)alkoxy, (lower)alkyl, (lower)alkylamino, hydroxy, guanidino, (lower)alkylthio, carboxy, phenyl, halophenyl, trifluoromethyl, di(lower)alkylamino, sulfamyl, (lower)alkanoylamino, phenyl(lower)alkylamido, cycloalkylamino, allylamido, mor-

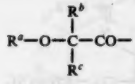
pholinocarbonyl, pyrrolidinocarbonyl, piperidinocarbonyl, tetrahydropyridino, furfurylamido or N-alkyl-N-anilino radicals; (c) C_3–C_{12} cycloalkyl; (d) substituted C_3–C_{12} cycloalkyl in which the substituents are one or more chloro, bromo, fluoro, iodo, nitro, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkylamino, C_1–C_2 alkoxy or amino radicals; (e) C_3–C_{12} cycloalkenyl, said cycloalkenyl group having 1 or 2 double bonds; or (f) substituted C_3–C_{12} cycloalkenyl, said cycloalkenyl group having 1 or 2 double bonds and being substituted by one or more chloro, bromo, fluoro, iodo, nitro, trifluoromethyl, C_1–C_4 alkyl, C_1–C_4 alkylamino, C_1–C_2 alkoxy or amino radicals; and n is an integer from 1–4;

$$C_nH_{2n+1}CO— \quad \text{(ii)}$$

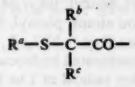
wherein *n* is an integer from 1–7, the alkyl portion of said acyl group being straight or branched and optionally interrupted by an oxygen or sulfur atom;

$$C_nH_{2n-1}CO— \quad \text{(iii)}$$

wherein *n* is an integer from 2–7, the alkenyl portion of said acyl group being straight or branched and optionally interrupted by an oxygen or sulfur atom;


(iv)

wherein R^a is as defined above under (i) and in addition may be benzyl, C_1–C_6 alkyl or (lower)alkoxy carbonyl and R^b and R^c which may be the same or different each represent hydrogen, phenyl, benzyl, phenethyl or C_1–C_6 alkyl;


(v)

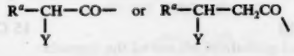
wherein R^a is as defined bove under (i) and in addition may be benzyl or C_1–C_6 alkyl and R^b and R^c are as defined under (iv);

$$R^aX(CH_2)_mCO— \quad \text{(vi)}$$

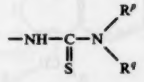
wherein R^a is as defined under (i) and in addition may be benzyl; X is oxygen or sulfur; and *m* is an integer of 2–5;

$$R^aCO— \quad \text{(vii)}$$

wherein R^a is as defined under (i);


(viii)

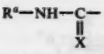
wherein R^a is as defined under (i) and Y is hydrazino, guanidino, ureido; substituted ureido of the formula



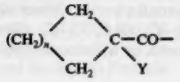
in which R^p is hydrogen or C_1–C_8 alkyl and R^q is hydrogen, C_1–C_8 alkyl, C_2–C_8 alkenyl, phenyl, benzoyl, C_1–C_8 alkoxy-C_1–C_8 alkyl or (carbo-C_1–C_8 alkoxy)C_1–C_8 alkyl; allophanamido; 3-guanyl-1-ureido; 3-(2-furoyl)ureido; 3-(benzoyl-)ureido; cyano; cyanamino; azido; amino; a group obtained by reacting the amino group Y with acetone, formaldehyde, acetaldehyde,butyraldehyde, acetylacetone, methyl acetoacetate, benzaldehyde, salicylaldehyde, methyl ethyl ketone or ethyl acetoacetate; hydroxy; (lower)alkoxy; carboxy; 5-indanyloxycarbonyl; triazolyl; tetrazolyl; halogeno; formyloxy; (lower-)alkanoyloxy; sulfo; or sulfoamino;

(ix)

wherein R^d, R^3 and R^f which may be the same or different may each represent C_1–C_6 alkyl, phenyl or phenyl substituted by one or more chloro, bromo, iodo, fluoro, trifluoromethyl, nitro, amino, cyano, (lower)alkanoyloxy, (lower)alkanoyl, (lower)alkoxyamino, (lower)alkoxy, (lower)alkyl, (lower)alkylamino, hydroxy, (lower)alkylthio, carboxy, di(lower)alkylamino or sulfamyl radicals;


(x)

wherein R^a is as defined under (i) and in addition may be hydrogen, C–C_6 alkyl, halogen-substituted C_1–C_6 alkyl, phenethyl, phenoxymethyl, benzyl or R^a—CO— and X is oxygen or sulfur;


(xi)

wherein Y is as defined under (viii) and *n* is an integer of 1–4;

$$R^gCH(NH_2)(CH_2)_nCO— \quad \text{(xii)}$$

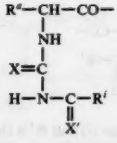
wherein *n* is an integer of 1–10, or

$$H_2N—C_nH_{2n}Ar(CH_2)_mCO—$$

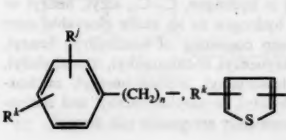
wherein *m* is 0 or an integer from 1–10, and *n* is 0, 1 or 2; R^g is hydrogen, (lower)alkyl, phenyl, benzyl or carboxy and Ar is p-phenylene or 1,4-naphthylene;

$$R^kCO.CO— \quad \text{(xiii)}$$

wherein R^k is 2-thienyl; 3-thienyl; α-naphthyl; 2-phenanthryl or a mono-, di- or tri-substituted phenyl group, the substituents being chloro, bromo, iodo, fluoro, amino, di(lower)alkylamino, (lower)alkyl, (lower)alkoxy, nitro or (lower)alkanoylamino;


(xiv)

wherein R^a is as defined under (i); X is oxygen or sulfur; X′ is oxygen or imino; and R^i is (lower)alyl, cycloalkyl having 4, 5, 6 or 7 carbon atoms, monohalo (lower) alkyl, dichloromethyl, trichloromethyl, (lower)alkenyl of 2–6 carbon atoms,



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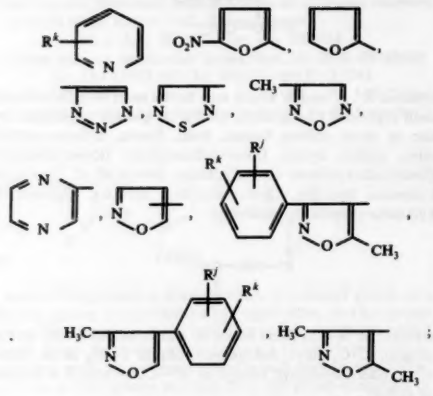
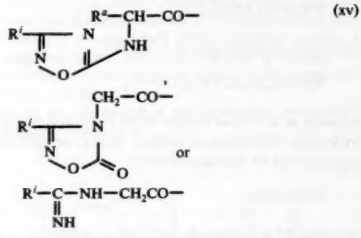


n is an integer from 0 to 3 inclusive and each of R^k and R^l is hydrogen, nitro, di(lower)alkylamino, (lower)alkanoylamino, (lower)alkanoyloxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, sulfamyl, chloro, iodo, bromo, fluoro, or trifluoromethyl;



(xv)

wherein R^a is as defined under (i) and R^l is as defined under (xiv); or

(xvi)

wherein R^a is as defined under (i) and R^1 is (lower)alkyl, cycloalkyl of 3–12 carbon atoms, phenyl, a monocyclic heterocyclic radical having 5 or 6 atoms exclusive of hydrogen which are C, S, N or O, no more than 2 atoms being other than C, or a substituted monocyclic heterocyclic radical as defined above having one or more halo, (lower)alkyl, (lower)alkoxy or phenyl substituents, Q is hydrogen, C_1–C_{10} alkyl, benzyl or phenethyl, and R'' is hydrogen or an easily cleavable ester selected from the group consisting of benzhydryl, benzyl, p-nitrobenzyl, p-methoxybenzyl, trichloroethyl, trimethylsilyl, phenacyl, acetonyl, (lower)alkyl, triphenylmethyl, methoxymethyl, indanyl, phthalidyl, pivaloyloxymethyl and acetoxymethyl, or a pharmaceutically acceptable salt thereof.

4,113,947

ADDITION PRODUCTS OF AN N-ALLYLAMINO-S-TRIAZINE AND AN ORGANOPOLYSILOXANE

Hans Deiner, Neusass; Franz Mosch, Gessertshausen, and Willy Bernheim, Diedorf, all of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

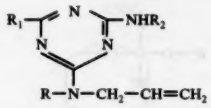
Filed Mar. 3, 1975, Ser. No. 554,819

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1974, 2411326; Dec. 13, 1974, 2459028

Int. Cl.[2] C07D *251/48, 251/70*

U.S. Cl. 544—196 **5 Claims**

1. An addition product of an N-allylaminotriazine and an organopolysiloxane containing hydrogen atoms bonded to silicon, which addition product is prepared by treatment, under substantially anhydrous conditions, of an organopolysiloxane, selected from the group consisting of methyl hydrogen polysiloxane, ethyl hydrogen polysiloxane, and phenyl hydrogen polysiloxane, wherein the ratio of silicon to silicon-bonded hydrogen is 6:1 to 16:1, and wherein the organopolysiloxane has a molecular weight of about 2800 to 16,000, with an N-methylolated N-allylaminotriazine, wherein the N-allylaminotriazine is selected from the group of the formula



where

R is hydrogen, an ethylenically unsaturated hydrocarbon radical of 3 carbon atoms, or alkyl of 1 to 10 carbon atoms,

R_1 is $—NH_2$, (straight-chain, branched or cyclic) alkyl of 1 to 6 carbon atoms, phenyl, benzyl, vinyl or hydrogen, and

R_2 is alkyl of 1 to 4 carbon atoms, phenyl, benzyl or hydrogen, provided that when R_1 is $—NH_2$, R_2 is hydrogen and R is an ethylenically unsaturated hydrocarbon radical of 3 carbon atoms or an alkyl radical of 1 to 10 carbon atoms, and provided that when R_1 is not $—NH_2$, R is not alkyl of 1 to 10 carbon atoms.

4,113,948

1-AMINO-1-PHTHALIDYL ALKANES AND A METHOD FOR PRODUCING SAME

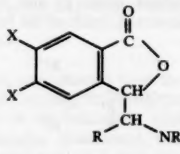
Avgust Karlovich Aren, ulitsa Siltsiema, 15/5, kv. 72, Riga; Irma Arnoldovna Berzinya, ulitsa Rezeknes, 25, kv. 2, Jurmala Latviiskoi SSR, and Ivars Petrovich Lentsbergs, ulitsa Zasulauka, 27, kv. 1, Riga, all of U.S.S.R.

Continuation of Ser. No. 443,037, Feb. 15, 1974, abandoned. This application Apr. 23, 1976, Ser. No. 679,869

Int. Cl.[2] C07D *295/00*

U.S. Cl. 544—152 **15 Claims**

1. A 1-amino-1-phthalidyl alkane of the formula:



wherein:

X = is selected from the group consisting of H, and CH_3O;

R is a radical selected from the group consisting of: CH_3, C_6H_5, p—$CH_3OC_6H_4$ and p—ClC_6H_4;

R′ is a radical selected from the group consisting of: H, and C_2H_5;

R″ is a radical selected from the group consisting of: H, CH_3, C_2H_5, $C_6H_5CH_2$, C_6H_5, and p—$CH_3OC_6H_4$

R′ and R″, when taken together, form a radical selected from the group consisting of: $-(CH_2)_4-$, $-(CH_2)_5-$; $-(CH_2)_2-O-(CH_2)_2-$; $-(CH_2)_2-N(C_6H_5)-(CH_2)_2-$; $-(CH_2)_2-N(p-CH_3O-C_6H_4-)-(CH_2)_2-$; and $-(CH_2)_2-N(o-CH_3OC_6H_4-)-(CH_2)_2-$.

4,113,949
5-FLUOROURACIL DERIVATIVES

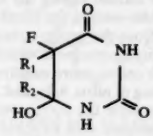
Paul D. Schuman, Hawthorne; Paul Tarrant, Gainesville; Dale A. Warner, Gainesville, and Geraldine Westmoreland, Gainesville, all of Fla., assignors to PCR, Inc., Gainesville, Fla.

Division of Ser. No. 186,444, Oct. 4, 1971, Pat. No. 3,954,758, which is a continuation-in-part of Ser. No. 41,519, May 27, 1970, abandoned, which is a continuation of Ser. No. 709,797, Mar. 1, 1968, abandoned, which is a continuation-in-part of Ser. No. 658,645, Aug. 7, 1967, abandoned. This application Mar. 11, 1976, Ser. No. 665,865

Int. Cl.² C07D *239/22*

U.S. Cl. 544—303 **4 Claims**

1. Compound of the formula



wherein

R_1 is fluorine or C_1-C_6 lower alkyl, and

R_2 is hydrogen or C_1-C_6 lower alkyl; provided that at least one of R_1 and R_2 is lower alkyl.

4,113,950
PROCESS FOR PREPARING OROTIC ACID AND THIOOROTIC ACID

Paul Rambacher, Rosenheim-Mitterfeld, and Siegfried Mike, Kirchdorf, Inn, both of Fed. Rep. of Germany, assignors to Diamalt Aktiengesellschaft, Munich, Fed. Rep. of Germany

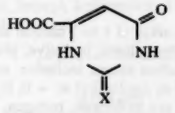
Division of Ser. No. 651,145, Jan. 21, 1976, Pat. No. 4,062,847. This application Sep. 6, 1977, Ser. No. 831,053

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1975, 2502951

Int. Cl.² C07D *239/54, 239/56*

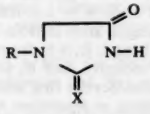
U.S. Cl. 544—314 **7 Claims**

1. A process for preparing a compound of the formula

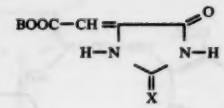


I

wherein X is oxygen or sulfur which comprises reacting a compound of the formula:



wherein R is hydrogen or an acyl group and X is as defined above, with glyoxylic acid in an alkaline medium to form a carboxymethylene intermediate of the formula:



wherein B is an inorganic or organic cation resulting from the alkaline medium and X is as defined above, converting said compound, in an alkaline medium into the salts of a compound of Formula I, above, and recovering the free acid.

4,113,951
AMINOALKOXYBENZOFURANS

Guy R. Bourgery, Colombes; Alain P. Lacour, La Varenne; Bernard M. Pourrias, Meudon la Foret, and Geneviéve C. Bregeon, Paris, all of France, assignors to Delalande S. A., Courbevoie, France

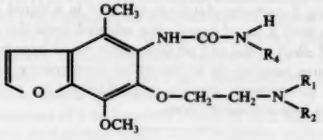
Filed Jul. 6, 1977, Ser. No. 813,357

Claims priority, application France, Jul. 12, 1976, 76 21287; Jun. 27, 1977, 77 19658

Int. Cl.² C07D *405/12, 405/14*

U.S. Cl. 544—360 **13 Claims**

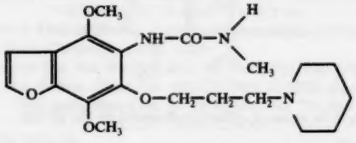
1. A compound having the formula



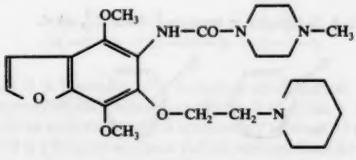
wherein R_4 is methyl or ethyl, and

is pyrrolidino, piperidino, hexamethyleneimino, heptamethyleneimino, 4-methyl piperidino, 4-methyl piperazino, or 1,2,5,6-tetrahydropyridino.

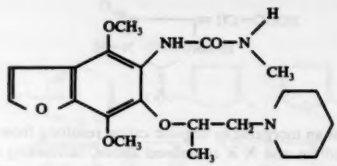
10. A compound having the formula



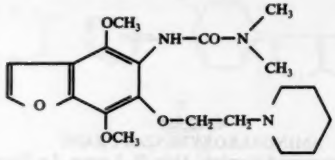
11. A compound having the formula



12. A compound having the formula



13. A compound having the formula



4,113,952

PROCESS FOR PREPARING 2-BENZIMIDAZOLONES

Duane A. Heyman, Waterville, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Jul. 22, 1977, Ser. No. 818,172

Int. Cl.[2] C07D *235/26*

U.S. Cl. 548—305 **19 Claims**

1. A process for preparing 2-benzimidazolone which comprises reacting 2'-carbamoylphthalanilic acid in a liquid alkaline medium with a metal hypohalite selected from the class consisting of alkali metal and alkaline earth metal hypohalites at temperatures ranging up to the reflux temperature of the medium and subsequently cooling and acidifying the medium to precipitate 2-benzmimidazolone.

4,113,953

2-NITROIMIDAZOLE DERIVATIVES

Bruno Cavalleri, and Giancarlo Volpe, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

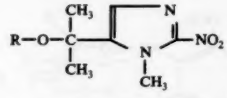
Filed Jan. 17, 1977, Ser. No. 759,697

Claims priority, application United Kingdom, Jan. 27, 1976, 2993/76

Int. Cl.[2] C07D *233/91*

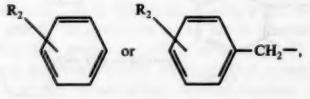
U.S. Cl. 548—339 **2 Claims**

1. The compound of the formula



wherein R is benzoyl, phenylcarbamoyl or the group

wherein R_1 is straight or branched-chain C_{1-4} alkyl,



in which R_2 is hydrogen, halo, cyano, amino, C_{1-2} alkyl or C_{1-3} alkoxy and X is oxygen or sulfur.

4,113,954

PROCESS FOR THE PREPARATION OF 3-ANILINO-5-PYRAZOLONES

David J. Tracy, Lincoln Park, N.J., and Walter F. Hoffstadt, Vestal, N.Y., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 603,533, Aug. 11, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 742,058

Int. Cl.[2] C07D *231/52*

U.S. Cl. 548—365 **17 Claims**

1. A process for the preparation of 3-anilino-5-pyrazolones comprising the steps of:

(a) combining a lower alkyl β-lower alkoxy-β-imino-propionate salt with a primary or secondary lower alkanol and an aniline or an aniline substituted with one or more substituents selected from the group consisting of nitro, halo and alkoxy, and combination thereof in a high boiling point solvent which has a boiling point above that of the alkanol by-product of the process and forming therefrom an orthoester in situ,

(b) heating while simultaneously removing the alkanol by-product from the reaction mixture containing said orthoester thereby to form an imidic ester,

(c) filtering the reaction mixture of (b) to remove the solid ammonium halide formed during the reaction.

(d) reacting said imidic ester in the filtrate with a phenylhydrazine selected from the group consisting of phenylhydrazine and a phenylhydrazine in which the phenyl group is substituted with one or more substituents selected from the group consisting of nitro, halo, and alkoxy, and combinations thereof, to form the corresponding amidine, and,

(e) contacting said amidine with a cyclization agent to effect ring closure thereby to form said desired product.

4,113,955

FURYL PYRAZOLE AMIDES

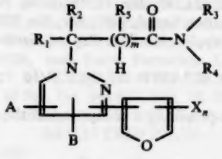
Malcolm W. Moon, and Gabriel Kornis, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 686,548, May 14, 1976, Pat. No. 4,072,498, which is a continuation-in-part of Ser. No. 524,231, Nov. 15, 1974, abandoned. This application Oct. 27, 1977, Ser. No. 846,158

Int. Cl.[2] C07D *405/04, 405/14*

U.S. Cl. 548—374 **7 Claims**

1. A compound of the formula:



IV

where R_1 is hydrogen, alkyl of 1 to 7 carbon atoms, inclusive, haloalkyl of 1 to 7 carbon atoms, inclusive, phenyl, benzyl or cycloalkyl of 3 to 6 carbon atoms, inclusive, with the proviso that when R_1 is benzyl or cycloalkyl $m = 0$; R_2 and R_5 are the same or different and are hydrogen, halogen, alkyl of 1 to 6 carbon atoms, inclusive, haloalkyl of 1 to 6 carbon atoms, inclusive, or phenyl; R_1 and R_2 together with the attached carbon atom can be cycloalkyl of 3 to 6 carbon atoms, inclusive, when $m = 0$; m is 0 or 1 provided that when $m = 0$, R_1 is not hydrogen and when $m = 1$ at least one of R_2 or R_5 is hydrogen; R_3 is hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, phenyl or benzyl; R_4 is hydrogen or alkyl of from 1 to 6 carbon atoms, inclusive, and R_3 and R_4 can be joined together to form a heterocyclic ring selected from the group consisting of pyrrolidine, or piperidine; A and B are the same or different and are hydrogen, alkyl of from 1 to 6 carbon atoms, inclusive, phenyl, halogen, cyano, haloalkyl of 1 to 6 carbon atoms, inclusive, alkoxy or alkylthio in which the alkyl group is from 1 to 3 carbon atoms, inclusive, or trifluoromethyl

and when adjacent can be joined to form a ring of from 5 to 7 carbon atoms, inclusive; where X is halogen, nitro, cyano, acetyl, dimethylcarbamoyl, alkyl, haloalkyl, alkoxy or carboalkoxy in which the alkyl group is from 1 to 3 carbon atoms, inclusive, phenyl, benzyl, 2-phenylethyl and *n* is 0, 1, or 2 or an acid addition salt thereof.

4,113,956
THIENYL PYRAZOLE AMIDES

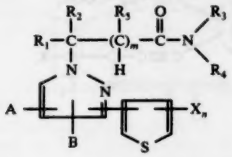
Malcolm W. Moon, and Gabriel Kornis, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 686,548, May 14, 1976, Pat. No. 4,072,498, which is a continuation-in-part of Ser. No. 524,231, Nov. 15, 1974, abandoned. This application Oct. 27, 1977, Ser. No. 846,159

Int. Cl.[2] C07D *409/04, 409/14*

U.S. Cl. 548—374 **10 Claims**

1. A compound of the formula:



III

where R_1 is hydrogen, alkyl of 1 to 7 carbon atoms, inclusive, haloalkyl of 1 to 7 carbon atoms, inclusive, phenyl, benzyl or cycloalkyl of 3 to 6 carbon atoms, inclusive, with the proviso that when R_1 is benzyl or cycloalkyl $m = 0$; R_2 and R_5 are the same or different and are hydrogen, halogen, alkyl of 1 to 6 carbom atoms, inclusive, haloalkyl of 1 to 6 carbon atoms, inclusive, or phenyl; R_1 and R_2 together with the attached carbon atom can be cycloalkyl of 3 to 6 carbon atoms, inclusive, when $m = 0$; m is 0 or 1 provided that when $m = 0$, R_1 is not hydrogen and when $m = 1$ at least one of R_2 or R_5 is hydrogen; R_3 is hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, phenyl or benzyl; R_4 is hydrogen or alkyl of from 1 to 6 carbon atoms, inclusive, and R_3 and R_4 can be joined together to form a heterocyclic ring selected from the group consisting of pyrrolidine, or piperidine; A and B are the same or different and are hydrogen, alkyl of from 1 to 6 carbon atoms, inclusive, phenyl, halogen, cyano, haloalkyl of 1 to 6 carbon atoms, inclusive, alkoxy or alkylthio in which the alkyl group is from 1 to 3 carbon atoms, inclusive, or trifluoromethyl and when adjacent can be joined to form a ring of from 5 to 7 carbon atoms, inclusive; where X is halogen, nitro, cyano, acetyl, dimethylcarbamoyl, alkyl, haloalkyl, alkoxy or carboalkoxy in which the alkyl group is from 1 to 3 carbon atoms, inclusive, phenyl, benzyl, 2-phenylethyl and *n* is 0, 1, or 2 or an acid addition salt thereof.

4,113,957
1-SUBSTITUTED PYRAZOLES

Eike Möller, Wuppertal, Germany; Karl-August Meng, deceased, late of Wuppertal, Germany (by Ilse Heide Frieda Meng, heir); Egbert Wehinger, Neviges, Germany; Harald Horstmann, Wuppertal, Germany, and Friedel Seuter, Neviges, Germany, assignors to Bayer Aktiengesellschaft, Germany

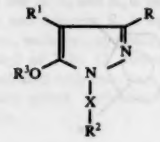
Filed Jun. 8, 1976, Ser. No. 693,971

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1975, 2526469

Int. Cl.[2] C07D *231/20*

U.S. Cl. 548—377 **14 Claims**

1. A compound of the formula



wherein

R is hydrogen, lower alkyl or trifluoromethyl;

R^1 is hydrogen or lower alkyl;

R^3 is R^6CO wherein

R^6 is lower alkyl; lower alkyl substituted by phenoxy; lower alkoxy; haloalkyl of 1 to 4 carbon atoms in the alkyl moiety and 1 to 3 halo atoms; cycloalkyl of 5 to 7 carbon atoms; lower alkylthio; haloalkoxy of 1 to 4 carbon atoms in the alkoxy moiety and 1 to 3 halo atoms; haloalkylthio of 1 to 4 carbon atoms in the alkyl moiety and 1 to 3 halo atoms; lower alkoxy(lower alkyl); mono- or di-lower alkylamino(lower akyl); phenyl unsubstituted or substituted by 1 to 3 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halo, trifluoromethyl, trifluoromethoxy, nitro, cyano, SO_n-alkyl of 1 to 4 carbon atoms in the alkyl moiety and n is 0 to 2, SO_n-CF_3 wherein n is 0 to 2, carbonamido or sulphonamido;

X is ethylene or ethylene wherein a hydrogen atom on one or both of the carbon atoms is substituted by alkyl of 1 to 4 carbon atoms, linked to R^2 via an oxygen or sulphur atom; and

R^2 is aryl of 6 to 10 carbon atoms unsubstituted or substituted by 1 or 2 substituents selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, halo, trifluoromethyl, trifluoromethoxy, cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms, nitro, cyano, carboxamido unsubstituted or substituted by 1 or 2 alkyl moieties of 1 to 4 carbon atoms, or by 2 alkylene moieties of 1 to 4 carbon atoms which together with the nitrogen atom form a 5- to 7- membered heterocyclic ring, sulphonamido unsubstituted or substituted by 1 or 2 alkyl moieties of 1 to 4 carbon atoms, or by 2 alkylene moieties of 1 to 4 carbon atoms which together with the nitrogen atom form a 5- to 7-membered heterocyclic ring, and SO_n-(lower alkyl) wherein n is 0 to 2; or phenyl having fused thereto a saturated or unsaturated 5- to 7-membered isocyclic ring.

4,113,958
ETHYLENICALLY UNSATURATED BLOCKED AROMATIC DIISOCYANATES

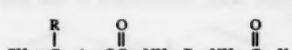
Harold A. Tucker, Shaker Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 550,627, Feb. 18, 1975, Pat. No. 4,008,247, which is a division of Ser. No. 412,325, Nov. 2, 1973, abandoned. This application Oct. 22, 1976, Ser. No. 734,945

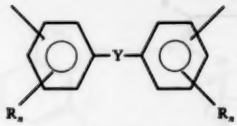
Int. Cl.[2] C07C *125/06*

U.S. Cl. 560—32 **10 Claims**

1. An ethylenically unsaturated blocked aromatic diisocyanate of the formula



wherein R is hydrogen or a methyl or ethyl radical; A is a carbonyloxyalkylene radical containing 2 to about 8 carbon atoms or an aralkylene radical containing 7 to about 12 carbon atoms; B is a bivalent aromatic radical selected from the group consisting of arylene, naphthalene, and the structure



where R is defined as above; Y is O, S, or $-(CH_2)_n-$ n = 0 to 3; and X is the radical fragment remaining after a hydrogen atom is removed from the nitrogen atom of an oxime.

4,113,959

METHOD FOR RESOLVING AMINO AND AMMONIUM COMPOUNDS

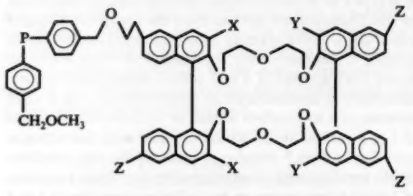
Donald J. Gram, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 672,211, Mar. 31, 1976, Pat. No. 4,043,979, which is a continuation-in-part of Ser. No. 448,333, Mar. 5, 1974, Pat. No. 4,001,279, which is a continuation-in-part of Ser. No. 346,089, Mar. 29, 1973, abandoned. This application Jun. 13, 1977, Ser. No. 806,054

Int. Cl.[2] C07C *101/02, 101/72*

U.S. Cl. 560—38 **5 Claims**

1. A method for resolving chemical enantiomers selected from the group consisting of amino carboxylic acids and their esters and the alkylammonium salts thereof which comprises passing a liquid containing the mixed enantiomers through a styrene/divinylbenzene resin-bound host compound of the formula



(III)

wherein P is the backbone of a solid styrene/divinylbenzene copolymer, each Z is H or CH_2CH_2OH, each X is either H or CH_3, each Y is either H or CH_3, and the binaphthyl groups of the macrocycle are in the (RR)- or (SS)- configurations, and recovering the separated enantiomers.

4,113,960

3-(4'-ALKOXY-BENZOYL)-1,2,2-TRIMETHYL-CYCLOPENTANE-CARBOXYLIC ACIDS, THEIR OPTICAL ISOMERS AND DRUGS CONTAINING SUCH COMPOUNDS

Henri-Ange Orzales, Montpellier, France, assignor to Societe Civile de Recherches et d'Etudes Nouvelles, Paris, France

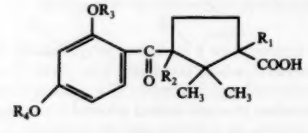
Continuation-in-part of Ser. No. 540,504, Jan. 13, 1975, Pat. No. 4,025,552. This application Jul. 15, 1976, Ser. No. 705,535

Claims priority, application France, Jul. 17, 1975, 75 22447

Int. Cl.[2] C07C *69/76*

U.S. Cl. 560—52 **13 Claims**

1. Carboxylic acids, characterized in that they have the formula III



III

in which:

R_1 denotes a methyl or ethyl radical and R_2 denotes a hydrogen atom, or R_1 is a hydrogen atom and R_2 denotes a methyl or ethyl radical; and

R_3 and R_4 denote a lower alkyl radical or a hydrogen atom, and the optical isomers and/or the alkyl esters and the salts of addition with physiologically tolerated acids.

4,113,961

3,7-INTER-M-PHENYLENE-3-OXA-4,5,6-TRINOR-13,14-DIDEHYDRO-11-DEOXY-PGE$_1$ COMPOUNDS

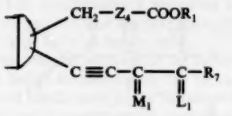
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 820,968

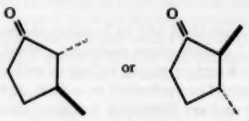
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—53 **73 Claims**

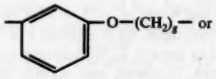
1. A prostaglandin analog of the formula

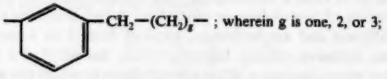


wherein D is



wherein Z_4 is



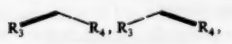


wherein *g* is one, 2, or 3;

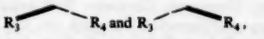
wherein R_7 is

$-(CH_2)_m-CH_3$, wherein *m* is one to 5, inclusive;

wherein L_1 is

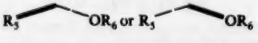


or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;

wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,113,962

5-OXA-13,14-DIDEHYDRO-11-DEOXY-17-PHENYL-18,19,20 TRINOR-PGE$_1$ COMPOUNDS

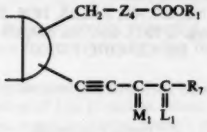
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 820,976

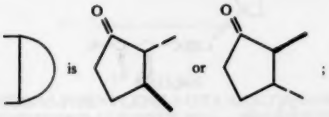
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 560—53 **73 Claims**

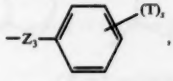
1. A prostaglandin analog of the formula



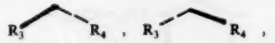
wherein



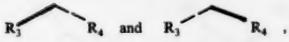
wherein Z_4 is $—CH_2—O—CH_2—(CH_2)_g—CH_2—$, $—(CH_2)—O—(CH_2)_g—CH_2—$, or $—(CH_2)_3—O—(CH_2)_g—$; wherein g is one, 2, or 3; wherein R_7 is



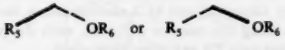
wherein Z_3 is oxa or methylene, s is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl; wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl, with the further proviso that one or both of R_3 and R_4 is fluoro only when Z_3 is methylene; wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,113,963

13,14-DIDEHYDRO-11-DEOXY-17-PHENYL-18,19,20-TRINOR-PGE$_1$ COMPOUNDS

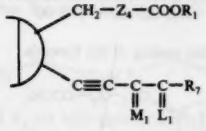
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 820,978

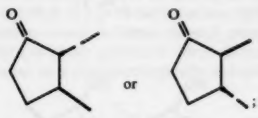
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 560—53 **73 Claims**

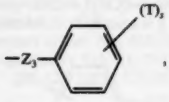
1. A prostaglandin analog of the formula



wherein D is

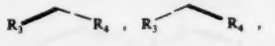


wherein Z_4 is $—(CH_2)_3—(CH_2)_g—CH_2—$ or $—(CH_2)_3—(CH_2)_g—CF_2$; wherein g is one, 2, or 3; wherein R_7 is

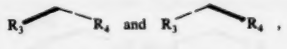


wherein Z_3 is oxa or methylene, s is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;

wherein L_1 is

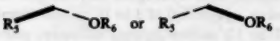


or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl, with the further proviso that one or both of R_3 and R_4 is fluoro only when Z_3 is methylene;

wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,113,964

13,14-DIDEHYDRO-11-DEOXY-17-PHENYL-18,19,20-TRINOR-PGF$_1\alpha$ COMPOUNDS

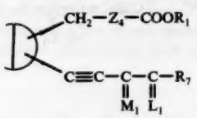
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 820,977

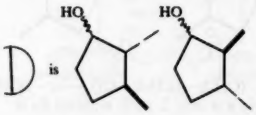
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—55 **73 Claims**

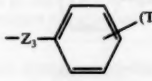
1. A prostaglandin analog of the formula



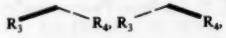
wherein



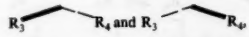
wherein Z_4 is $-(CH_2)_3-(CH_2)_g-CH_2-$ or $-(CH_2)_3-(CH_2)_g-CF_2-$; wherein g is one, 2, or 3; wherein R_7 is



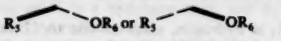
wherein Z_3 is oxa or methylene, s is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl; wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl, with the further proviso that one or both of R_3 and R_4 is fluoro only when Z_3 is methylene; wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,113,965

3,7-INTER-M-PHENYLENE-3-OXA-13,14-DIDEHYDRO-11-DEOXY-17-PHENYL-4,5,6,18,19,20-HEXANOR-PGF$_1\alpha$ COMPOUNDS

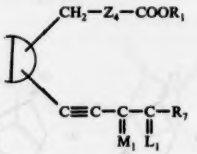
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 821,058

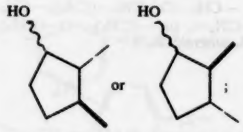
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—61 **73 Claims**

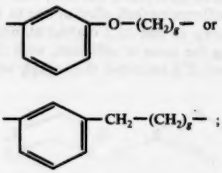
1. A prostaglandin analog of the formula



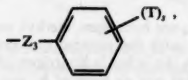
wherein D is



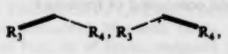
wherein Z_4 is



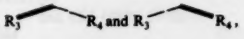
wherein g is one, 2, or 3;
wherein R_7 is



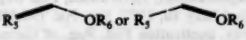
wherein Z_3 is oxa or methylene, s is zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein L_1 is



or a mixture of



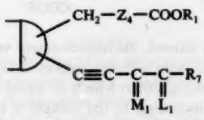
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl, with the further proviso that one or both of R_3 and R_4 is fluoro only when Z_3 is methylene;
wherein M_1 is



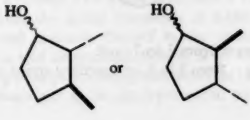
wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is met-yl only when the other is hydrogen; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,113,966
3,7-INTER-M-PHENYLENE-3-OXA-4,5,6-TRINOR-13,14-DIDEHYDRO-11-DEOXY-PGF$_1\alpha$ COMPOUNDS
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 820,967
Int. Cl.^{2} C07C *177/00*
U.S. Cl. 560—61 **73 Claims**

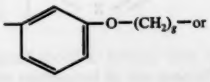
1. A prostaglandin analog of the formula



wherein is



wherein Z_4 is



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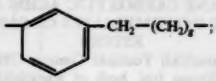
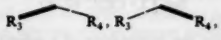
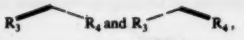


wherein g is one, 2, or 3;

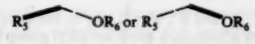
wherein *g* is one, 2, or 3;
wherein R_7 is
$-(CH_2)_m-CH_3$, wherein *m* is one to 5, inclusive;



or a mixture of



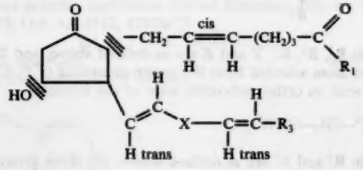
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;



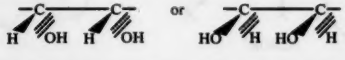
wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,113,967
15,16-DIOXY PROSTENOIC ACIDS AND ESTERS
Martin Joseph Weiss, Oradell, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of Ser. No. 663,603, Mar. 3, 1976, abandoned. This application Feb. 11, 1977, Ser. No. 767,863
Int. Cl.^{2} C07C *177/00*
U.S. Cl. 560—121 **17 Claims**

1. An optically active compound of the formula:



which represents the natural (nat.) configuration or a racemic mixture of that compound and the enantiomer thereof, wherein R_1 is hydroxy or C_1–C_5 alkoxy; R_3 is methyl, ethyl or propyl; X is divalent radical



and the pharmacologically acceptable cationic salts thereof when R_1 is hydroxy.

4,113,968

PROCESS FOR PREPARATION OF SUBSTITUTED CYCLOPROPANE CARBOXYLIC ACIDS AND ESTERS THEREOF AND INTERMEDIATES OF SAID ACIDS AND ESTERS

Fumio Mori, Kurashiki; Yoshiaki Omura, Okayama; Takashi Nishida, and Kazuo Itoi, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

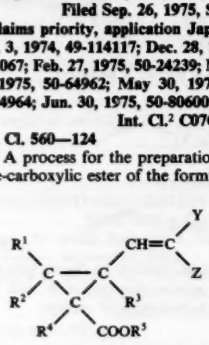
Filed Sep. 26, 1975, Ser. No. 616,998

Claims priority, application Japan, Oct. 3, 1974, 49-114116; Oct. 3, 1974, 49-114117; Dec. 28, 1974, 50-2066; Dec. 28, 1974, 50-2067; Feb. 27, 1975, 50-24239; May 23, 1975, 50-61558; May 30, 1975, 50-64962; May 30, 1975, 50-64963; May 30, 1975, 50-64964; Jun. 30, 1975, 50-80600; Aug. 28, 1975, 50-104224

Int. Cl.[2] C07C *67/30*

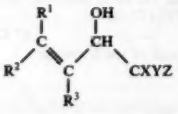
U.S. Cl. 560—124 **15 Claims**

1. A process for the preparation of a substituted cyclopropane-carboxylic ester of the formula



I'

wherein R^1, R^2, R^3 and R^4, which may be the same or different, each represents a hydrogen atom, an alkyl group having up to 15 carbon atoms, a cycloalkyl group having up to 8 carbon atoms, an alkenyl group having up to 15 carbon atoms, a cycloalkenyl group having up to 8 carbon atoms, an alkynyl group having up to 15 carbon atoms, an aryl group having up to 8 carbon atoms or am aralkyl group having up to 10 carbon atoms or R^1 and R^2 or R^1 and R^3 together with the carbon atoms to which they are attached form a ring; R^5 represents an alkyl group having up to 15 carbon atoms, a cycloalkyl group having up to 8 carbon atoms, an alkenyl group having up to 15 carbon atoms, a cycloalkenyl group having up to 8 carbon atoms, an aralkyl group having up to 10 carbon atoms or a hydrocarbon group containing a hetero atom selected from the group consisting of nitrogen, phosphorus, sulfur and oxygen; and Y and Z, which may be the same or different, each represents a hydrogen atom or a halogen atom selected from the group consisting of F, Cl, Br and I, which process comprises (i) reacting at a temperature of from 100° C to 200° C, a 1-halogen-3-alkene-2-ol of the formula

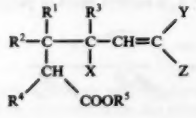


II

wherein R^1, R^2, R^3, Y and Z are as defined above, and X is a halogen atom selected from the group consisting of F, Cl, Br and I, with an ortho-carboxylic ester of the formula

$$R^4—CH_2—C(OR^5)_3 \qquad \text{III}$$

wherein R^4 and R^5 are as defined above, the three groups R^5 being the same or different, to produce a γ-halogeno-δ-unsaturated-carboxylic acid ester of the formula



V

wherein R^1, R^2, R^3, R^4, R^5, X, Y and Z are as defined above, and (ii) treating said compound of formula V with a basic substance at a temperature of from about −80° C to about 100° C to produce said compound of formula I'.

4,113,969

PREPARATION OF 2,2-DIMETHYL-3-(2,2-DIHALOGENOVINYL)-CYCLOPROPANE-1-CARBOXYLIC ACID ESTERS

Reinhard Lantzsch, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

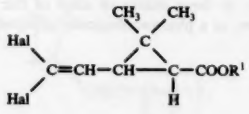
Filed May 10, 1977, Ser. No. 795,588

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623848

Int. Cl.[2] C07C *51/38*

U.S. Cl. 560—124 **5 Claims**

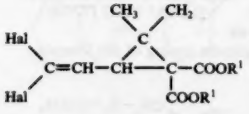
1. In the preparation of a 2,2-dimethyl-3-(2',2'-dihalogenovinyl)-cyclopropane-1-carboxylic acid ester of the formula



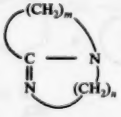
in which

Hal is halogen, and

R_1 is alkyl with 1 to 4 carbon atoms, by heating a 2,2-dimethyl-3-(2',2'-dihalogenovinyl)-cyclopropane-1,1-dicarboxylic acid ester of the formula



in an inert organic diluent, the improvement which comprises employing as the diluent a hydrocarbon, halogenated hydrocarbon or high-boiling ether which is liquid at the reaction temperature, and including in the diluent a base which is a bicyclic amidine of the formula



in which

m is an interger from 3 to 7, and

n is an interger from 2 to 4, or a tertiary amine of the formula

in which

X is N or CH.

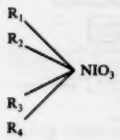
4,113,970

PROCESS FOR PRODUCING 1,4-DIACYLOXYBUTENE-2

Masanori Tanabe, Kurashiki; Masanori Ikeda, and Nobuhiro Tamura, both of Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 11, 1977, Ser. No. 786,325
Claims priority, application Japan, Apr. 14, 1976, 51-41421; Apr. 28, 1976, 51-47769
Int. Cl.[2] C07C *67/05*
U.S. Cl. 560—244 15 Claims

1. A process for producing 1,4-diacyloxybutene-2 comprising reacting 1,3-butadiene with an aliphatic carboxylic acid having 2 to 5 carbon atoms and molecular oxygen in the presence of a catalyst which contains metallic palladium and at least one iodine-containing substance selected from the group consisting of iodine; iodic acid; alkali metal iodates; iodates of the formula (I):



(I)

hydrogen iodide; alkali metal iodides; and iodides of the formula (II):

(II)

wherein R_1, R_2, R_3 and R_4 each independently is a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, an aralkyl group or an aryl group, or R_1, R_2, R_3 and the nitrogen atom together form a nitrogen-containing heterocyclic ring, the ratio in gram-atom of iodine to metallic palladium in said catalyst being 0.1 to 1.5:1.

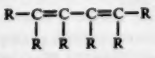
4,113,971

PROCESS FOR PREPARING DIACYLOXY OLEFINS

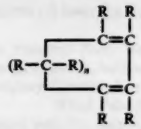
Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 21, 1975, Ser. No. 551,834
Int. Cl.[2] C07C *67/05*
U.S. Cl. 560—246 7 Claims

1. A process for the production of unsaturated diesters which comprises reacting a conjugated diolefin with a carboxylic acid by contacting said diolefin and said acid with a catalytic amount of a catalyst consisting essentially of a Group VIB metal oxide or a Group VIB metal oxide and a catalyst adjuvant selected from the group consisting of alkali metal salts, dihalobutenes and mixtures thereof in the presence of free oxygen, wherein said conjugated diolefin is selected from the group consisting of acyclic conjugated diolefins having from 4 to 16 carbon atoms per molecule represented by the general formula



and cyclic conjugated diolefins having from 5 to 16 carbon atoms per molecule represented by the general formula



wherein, in each formula, each R is independently selected from the group consisting of hydrogen, halogen, cyano, —COOR′, and alkyl, aryl and cycloalkyl radical groups and combinations thereof, of up to 12 carbon atoms per radical group, wherein R′ is selected from the group consisting of hydrogen, alkyl of up to 10 carbon atoms and aryl of up to 10 carbon atoms; and wherein n is an integer having a value of 1 to 12 and wherein said carboxylic acid is selected from the group consisting of monocarboxylic acids having from 2 to 18 carbon atoms per molecule represented by the general formula

R″—COOH

and dicarboxylic acids having from 2 to 18 carbon atoms per molecule represented by the general formula

R‴(COOH)$_2$

wherein R″ is selected from the group consisting of alkyl, cycloalkyl and aryl radical groups and halogen, cyano and —COOR′ substituted derivatives thereof, wherein up to four of said halogen, cyano or —COOR′ substituents can be present in said radical, wherein R′ is selected from the group consisting of hydrogen, alkyl of up to 10 carbon atoms and aryl of up to 10 carbon atoms;

wherein R‴ is selected drom the group consisting of a valence bond and alkylene, cycloalkylene and arylene radical groups and halogen, cyano and —COOR′ substituted derivatives thereof wherein up to four of said halogen, cyano or —COOR′ substituents can be present in said radical, wherein R′ is as defined above; and

wherein said salt is employed in an amount ranging from about 0.1 to about 2 molar based on said acid and said dihalobutene is employed in an amount ranging from about 0.1 to about 10 moles per mole of said metal oxide.

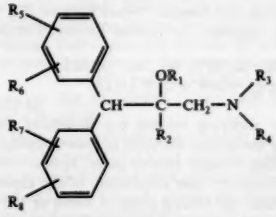
4,113,972

ESTERS OF DERIVATIVES OF 1,1-DIPHENYL-3-AMINO-PROPAN-2-OL

Judith Ann Clark, Barrington, England, assignor to Beecham Group Limited, England

Division of Ser. No. 443,021, Feb. 15, 1974, Pat. No. 4,028,415.
This application Jun. 21, 1976, Ser. No. 698,091
Claims priority, application United Kingdom, Feb. 24, 1973, 9183/73; Oct. 13, 1973, 47928/73
Int. Cl.[2] C07C *93/00, 93/26*
U.S. Cl. 560—250 15 Claims

1. A compound of the formula



(III)

or a pharmaceutically acceptable salt or hydrate thereof or mixtures of optical isomers of the above formula, wherein R_1 is $CO.R_9$ wherein R_9 is alkyl of 1 to 6 carbon atoms, phenyl or

benzyl; R_2 is hydrogen; R_3 is hydrogen or methyl; R_4 is methyl; R_5 is fluorine, chlorine or bromine; and R_6, R_7 and R_8 are each hydrogen.

4,113,973

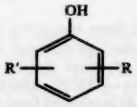
PROCESS FOR THE PREPARATION OF ANHYDROUS SOLUTIONS OF ALKALINE PHENATES IN ORGANIC SOLVENTS

Enzo Alneri; Giorgio Bottaccio; Stefano Campolmi, and Luigi Cassar, all of Novara, Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Jul. 19, 1977, Ser. No. 816,919
Claims priority, application Italy, Jul. 23, 1976, 25636/76
Int. Cl.[2] C07C *39/04*
U.S. Cl. 568—716 **6 Claims**

1. A process for the preparation of anhydrous solutions of alkaline phenates in organic solvents, comprising the steps:

(a) synthesis in water of alkaline phenates by the reaction of an alkaline sulphate selected from the class consisting of sodium sulphate and potassium sulphate, with calcium hydroxide and a phenol of the general formula:



wherein R and R', which may be the same or different from each other, are hydrogen atoms or linear alkyl groups having from 1 to 4 carbon atoms, at a temperature substantially lower than 30° C;

(b) filtering the calcium sulphate;

(c) quantitatively decalcifying the residual aqueous solution, at a temperature between 40° and 60° C, by the addition of an aqueous solution of an alkali selected from the class consisting of NaOH and KOH, until a total concentration is reached which is between 30% and 50% by weight of the total solution;

(d) filtering the precipitated calcium hydroxide and alkaline sulphate;

(e) extracting in countercurrent, at a temperature between 50° and about 90° C, the residual aqueous solution with at least one aprotic polar organic solvent selected from the class consisting of β-picoline, dimethylether of diethylene glycol, quinoline, tetrahydrofuran, dimethylsulphoxide, sulpholane and N-methyl-morpholine; and

(f) dehydrating the organic solution of the alkaline phenates.

4,113,974

PROCESS FOR PURIFYING IMPURE DIPHENOLS

Victor Mark, Evansville, and Charles Vernon Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 30, 1976, Ser. No. 755,981
Int. Cl.[2] C07C *37/22, 37/24*
U.S. Cl. 568—750 **12 Claims**

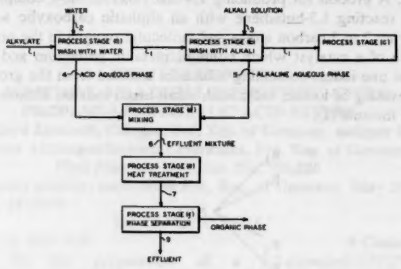
1. A process for purifying impure p,p'-diphenols which comprises dispersing the impure diphenol in water, heating the resulting slurry, adding a water soluble polar, aprotic co-solvent until the dissolution or near dissolution of the diphenol slurry results at or near the boiling point of water or the solvent system, cooling the solution to achieve the separation of the purified diphenol and recovering the purified p,p'-diphenol.

4,113,975

PROCESS FOR PURIFYING ALKYLPHENOLZ

Helmut Fiege; Josef Haydn; Johann Renner, all of Leverkusen, and Karlfried Wedemeyer, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 6, 1977, Ser. No. 757,422
Claims priority, application Fed. Rep. of Germany, Jan. 21, 1976, 2602149
Int. Cl.[2] C07C *37/28*
U.S. Cl. 568—756 **16 Claims**



1. A process for removing acids and potential acid-forming agents from the alkylphenol mixture obtained by reacting phenols with alkenes in the presence of sulfuric acid or sulfonic acids, for the treating effluent thereby obtained and for removal of organics from wash water obtained in the treatment of said effluent, comprising the steps of:

(a) extracting the bulk of the acid constituents from the alkylphenol mixture by means of water;

(b) treating the alkylphenol mixture with dilute aqueous alkali solution in an amount such that the alkali is insufficient to neutralize all the acid originally present in the alkylphenol mixture;

(c) separating the alkylphenol mixture from the aqueous alkali solution;

(d) combining the aqueous phases obtained in steps (a) and (b);

(e) heating the combined aqueous phases to a temperature of 100° to 200° C;

(f) separating off the organic phase obtained in step (e) and

(g) discharging the aqueous phase.

4,113,976

METHOD OF PREPARING 2,6-DI-TERT.BUTYLPHENOL

Jury Ivanovich Michurov, prospekt Lenina, 13, kv. 4; Boris Izrailevich Pantukh, ulitsa Khudaiberdina, 162, kv. 89, both of Bashkirskaya ASSR; Valerian Mikhailovich Sobolev, Maxima Gorkogo, 48/50, kv. 185, Moscow; Grigory Iosifovich Rutman, ulitsa Revoljutsionnaya, 7, kv. 6, Bashkirskaya ASSR; Igor Jurievich Logutov, ulitsa Druzhby, 47, kv. 50, Bashkirskaya ASSR, and Vladimir Romanovich Dolidze, ulitsa Kurchatova, 30, kv. 8, Bashkirskaya ASSR, all of U.S.S.R.

Filed Apr. 18, 1977, Ser. No. 788,590
Int. Cl.[2] C07C *39/02*
U.S. Cl. 568—789 **1 Claim**

1. A method of preparing 2,6-di-tertbutylphenol comprising alkylation of phenol with isobutylene at a temperature of from 100° to 110° C in the presence of 0.5 to 1% by weight of phenoloxyorthotertbutylphenoxyhydroaluminum acid having the formula:

$$[(OC_6H_5)_n(\text{ortho-tert.}C_4H_9C_6H_4O)_mAl]H$$

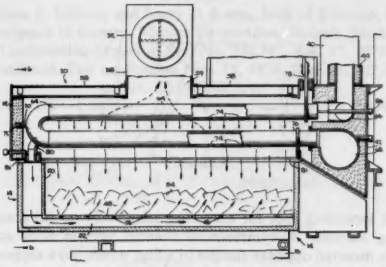
wherein $n = 1$ to 3, $m = 1$ to 3; $n+m = 4$, to form an alkylate, hydrolyzing said catalyst; vacuum rectifying the alkylate; and recovering 2,6-di-tertbutylphenol by recrystallization.

4,113,977

PREHEATING SYSTEM WITH GAS RECIRCULATION

Otto Hochstrasser, North Brunswick, and William S. Ruby, East Brunswick, both of N.J., assignors to Brown Boveri Corporation, North Brunswick, N.J.

Filed Aug. 19, 1977, Ser. No. 826,189
Int. Cl.[2] F27D *13/00, 17/00*
U.S. Cl. 13—2 R 23 Claims



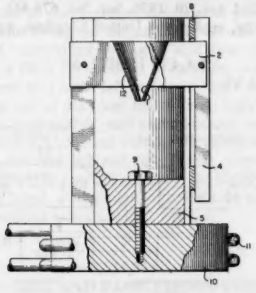
7. Apparatus for heating material which includes vaporizable combustible constituents, said apparatus comprising an enclosure for containing said material, at least one conduit extending inside said enclosure, blower means arranged to withdraw vaporized combustible constituents from said enclosure and to direct said constituents, together with combustion air, as a combustible mixture, through said conduit and electrical circuit means connected to direct electrical current through said conduit inside said enclosure to heat said conduit above the ignition temperature of said mixture contained therein.

4,113,978

EVAPORATION SOURCE FOR VACUUM DEPOSITION

Igor Melnick, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed May 17, 1977, Ser. No. 797,849
Claims priority, application France, May 24, 1976, 76 15684
Int. Cl.[2] H05B *3/10*
U.S. Cl. 13—22 4 Claims



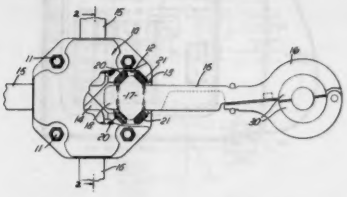
1. An evaporation source for vacuum deposition, comprising a refractory crucible provided in its outer surface with conducting members traversed by an electric current and able to raise the crucible temperature by Joule effect, wherein the said outer surface is coated, prior to fitting the conducting members, with a thin intermediate coating layer which does not react with the crucible but which is in intimate contact with the latter and wherein the crucible is beryllium oxide and the intermediate layer is selected from the group consisting of molybdenum and tungsten.

4,113,979

SPACING DEVICES FOR OVERHEAD TRANSMISSION LINES

Ralph Percival Torr, New Malden, and Miles Albert Beauchamp, Crawley, both of England, assignors to Andre Rubber Company Limited, England

Filed Feb. 3, 1977, Ser. No. 765,274
Claims priority, application United Kingdom, Feb. 6, 1976, 4746/76
Int. Cl.[2] H02G *7/14, 7/12*
U.S. Cl. 174—42 13 Claims



1. A spacing device for spacing individual conductors of an overhead transmission line, the device comprising a hub having at least two cavities therein each opening onto the hub periphery, at least two arms each having a conductor clamp at one end and being formed with a knob at or adjacent the other end, the knob being received with clearance within a respective cavity to permit limited articulation of each arm with respect to the hub; and elastomeric bush means substantially encircling the arm in the clearance gap between the knob and the cavity wall, each half of the bush means on opposing sides of a maximum diameter portion of the knob having an initial generally semicircular cross-sectional shape, deformed by compression between said knob and said cavity wall during assembly of the device such that the edges or side portions of the deformed cross-sections of said bush means include elastomeric material displaced laterally from the central portions during compression thereof.

4,113,980

VEHICLE DIAGNOSTIC HAND CONTROL

Mace Bell, Rowayton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

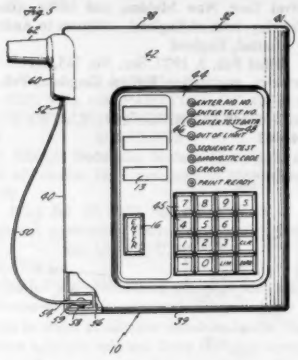
Continuation of Ser. No. 647,373, Jan. 8, 1976, abandoned, which is a division of Ser. No. 534,335, Dec. 19, 1974, abandoned. This application Jul. 28, 1977, Ser. No. 819,744
The portion of the term of this patent subsequent to Dec. 14, 1990, has been disclaimed.
Int. Cl.[2] G01M *15/00;* G06F *3/02*
U.S. Cl. 174—52 R 2 Claims

1. A hand control for electrical vehicle diagnostic equipment adapted to be held in the hand of a user comprising:

a case having front and back surfaces, top and bottom edges, and right and left side edges, the distance between said front and rear surfaces being such as to permit holding of the unit by a first one of said side edges in one hand of a user, said first side edge being rounded so as to facilitate gripping in the hand;

a strap extending between the upper and lower ends of said

one side edge, said strap adapted to support the rear of the hand of the user gripping said one side edge; and



an interconnection cable including a plurality of electrical conductors entering said case at the upper end of said one side edge in a direction perpendicular thereto.

4,113,981

ELECTRICALLY CONDUCTIVE ADHESIVE CONNECTING ARRAYS OF CONDUCTORS

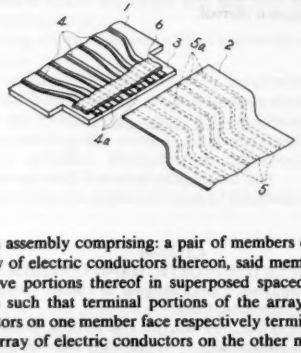
Masanori Fujita, Matsudo, and Sukenori Suzuki, Narashino, both of Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Division of Ser. No. 602,446, Aug. 6, 1975, abandoned. This application Dec. 17, 1976, Ser. No. 751,730

Claims priority, application Japan, Aug. 14, 1974, 49/93080; Aug. 14, 1974, 49/93082

Int. Cl.[2] H02G *15/08;* **H01R** *5/02;* **H01B** *1/00*

U.S. Cl. 174—88 R **5 Claims**



1. An assembly comprising: a pair of members each having an array of electric conductors thereon, said members having respective portions thereof in superposed spaced-apart relationship such that terminal portions of the array of electric conductors on one member face respectively terminal portions of the array of electric conductors on the other member; and means adhering together said pair of members to electrically connect facing terminal portions of both arrays of electric conductors and electrically insulate adjoining terminal portions of both arrays of electric conductors, said means comprising an electrically non-conductive adhesive material adhering together said pair of members, and electrically conductive particles incorporated and mixed in said adhesive material, said particles being disposed in essentially a single layer and having a size sufficiently large with respect to the spacing distance between said members to electrically connect said facing terminal portions of both arrays of electric conductors, and said particles being spaced apart by said adhesive material distances sufficient to electrically insulate adjoining terminal portions of both arrays of electric conductors.

4,113,982

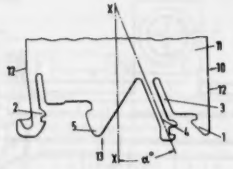
MEANS FOR MOUNTING ON CHANNEL-SECTION SUPPORTING RAILS

Gottfried Glaesel, Minusio, Switzerland, assignor to Hego Electric GmbH, Glarus, Switzerland

Filed Apr. 26, 1976, Ser. No. 680,411

Int. Cl.[2] H05K *7/12;* **H01R** *9/16, 9/22;* **F16B** *2/22*

U.S. Cl. 174—158 R **7 Claims**



1. A mounting foot for mounting selectively on (a) a supporting member of symmetrical channel section with outwardly directed opposite flanges of a first width, (b) a supporting member of symmetrical channel section with outwardly directed opposite flanges of a second width, and (c) a supporting member of asymmetrical channel section with inwardly directed opposite flanges, said foot comprising a row of two outer and two inner projections, said outer two projections having inwardly facing recesses for engaging said outwardly directed flanges, and said inner two projections having outwardly facing recesses for engaging said inwardly directed flanges, alternate projections being rigid and resiliently flexible, respectively, said inwardly facing recesses defining an interconnecting line, a first said inner projection being rigid and having its said recess above said line and the second said inner projection comprising a resiliently flexible finger, said recess in said second inner projection comprising a notch below said line, the spacing between said first inner projection and the immediately adjacent outer projection being substantially greater than the spacing between said second inner projection and the outer projection immediately adjacent thereto.

4,113,983

INPUT FILTERING APPARATUS FOR LOUDSPEAKERS

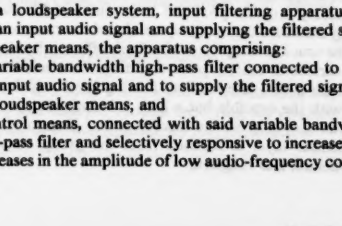
Paul Franklin Steel, Luton, England, assignor to Teledyne Acoustic Research, Norwood, Mass.

Filed Apr. 20, 1976, Ser. No. 678,461

Claims priority, application United Kingdom, Apr. 24, 1975, 16999/75

Int. Cl.[2] H04B *1/64*

U.S. Cl. 179—1 VL **8 Claims**



3. In a loudspeaker system, input filtering apparatus for filtering an input audio signal and supplying the filtered signal to loudspeaker means, the apparatus comprising:

(i) a variable bandwidth high-pass filter connected to filter the input audio signal and to supply the filtered signal to the loudspeaker means; and

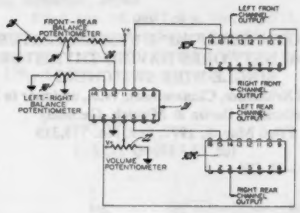
(ii) control means, connected with said variable bandwidth high-pass filter and selectively responsive to increases and decreases in the amplitude of low audio-frequency compo-

nents of the audio signal, for respectively increasing and decreasing the breakpoint frequency of said filter so as to limit the amplitude of the low audio-frequency components of the signal supplied to the loudspeaker means.

4,113,984
VOLTAGE TRANSLATING CIRCUIT FOR VOLUME AND BALANCE CONTROL OF A FOUR-CHANNEL AUDIO SYSTEM

William F. Gilbert, and Larry D. Lucas, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 724,747, Sep. 17, 1976, abandoned. This application Nov. 15, 1976, Ser. No. 741,805
Int. Cl.² H04R *5/00*
U.S. Cl. 179—1 GQ **5 Claims**


FRONT - REAR BALANCE POTENTIOMETER
LEFT - RIGHT BALANCE POTENTIOMETER
VOLUME POTENTIOMETER
LEFT FRONT CHANNEL OUTPUT
RIGHT FRONT CHANNEL OUTPUT
LEFT REAR CHANNEL OUTPUT
RIGHT REAR CHANNEL OUTPUT

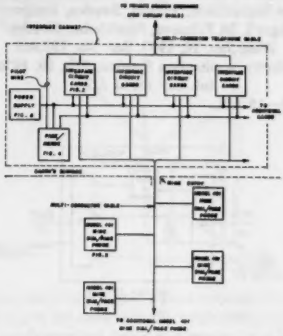
1. A balance control for a four channel audio system providing front left and right audio output signals and rear left and right audio output signals in response to respective audio input signals, said control comprising, first circuit means responsive to a first DC control voltage for attenuating said front left and right audio input signals, second circuit means responsive to a second DC voltage for attenuating said rear left and right audio input signals, a master volume control potentiometer means, a front-rear balance control potentiometer means, a voltage translating circuit responsive to the setting of said volume control potentiometer means and said balance control potentiometer means for developing said first and second DC control voltages, the upper limit of said first and second control voltages being established by the setting of said volume control potentiometer means, said front-rear balance potentiometer means reducing the magnitude of one of said first or second DC control voltages from said upper limit to a lower limit as said front-rear potentiometer means is moved from a balance position to one extreme unbalanced position respectively while maintaining the magnitude of the other of said first or second DC controlled voltages, said first circuit means responsive to a third DC control voltage for controlling the balance between said front left and right audio output signals by attenuating one of the front left or front right audio input signals relative to the other, said second circuit means responsive to said third DC control voltage for controlling the balance between the rear left and right audio output signals by attenuating one of the rear left or rear right audio input signals relative to the other, a single left-right balance potentiometer means for providing said third DC voltage.

4,113,985
MINE DIAL AND PAGE PHONE SYSTEM

Paul B. Day, Reading, Pa., assignor to Gai-Tronics Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 585,304, Jun. 9, 1975, abandoned. This application Jan. 3, 1977, Ser. No. 756,238
Int. Cl.² H04M *1/18*
U.S. Cl. 179—2 R **8 Claims**

1. An underground telephone communication system for coal mines and other facilities that must be devoid of explosion producing sparks, comprising an above-ground dial telephone system connected to an automatic switchboard, a plurality of completely electronic interface circuit devices, devoid of components which store unsafe levels of electrical energy, connected to said switchboard and also connected to separate underground dial and page phone stations, each of said stations including a loudspeaker, to provide a separate, private line to each of a plurality of said stations to enable simultaneous, separate conversations over said private line between said stations and other underground or above-ground dial telephones, said interface circuit devices, one for each of said

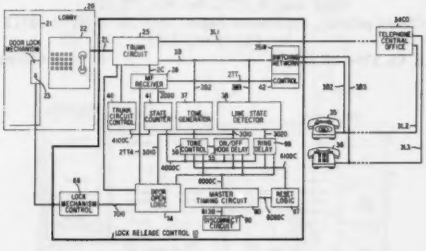


private lines, including means for automatically removing the ringing voltage of said above-ground telephone system and transmitting, instead, a relatively lower bias voltage with a superimposed pulsating ringing tone to the desired loudspeaker of any one of said underground stations together with means to enable the calling party to page through said desired loudspeaker following said bias voltage with a superimposed pulsating ringing tone.

4,113,986
TELEPHONE CONTROLLED LOCK RELEASE ARRANGEMENT

George Frederick Clement, Naperville, Ill., and Bruno Raymond Sniegowski, Westerville, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J. and Western Electric Company, New York, N.Y.

Filed Oct. 21, 1977, Ser. No. 844,377
Int. Cl.² H04M *11/00*
U.S. Cl. 179—2 A **40 Claims**



1. A lobby-apartment communication and lobby door lock control system comprising:

means for establishing a voice communication path from a lobby telephone over a communication line and a telephone central office to an apartment telephone;

lock control means, and

means responsive to a receipt of coded signals by said establishing means for providing a switched signaling path independent of said central office and between said apartment telephone and said control means; and

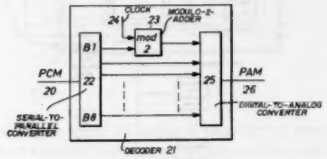
said control means comprising means responsive to a receipt of authorization signals from said apartment telephone via said switched signaling path for generating a control signal to effect an opening of a lobby door lock.

4,113,987

METHOD FOR IMPROVEMENT OF CROSSTALK ATTENUATION BETWEEN ADJACENT CHANNELS IN A TIME DIVISION MULTIPLEX SYSTEM

Kurt Anders Samuelsson, Tyreso, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jan. 10, 1977, Ser. No. 757,863
Claims priority, application Sweden, Feb. 10, 1976, 7601451
Int. Cl.² H04J 3/10
U.S. Cl. 179—15 AN **2 Claims**



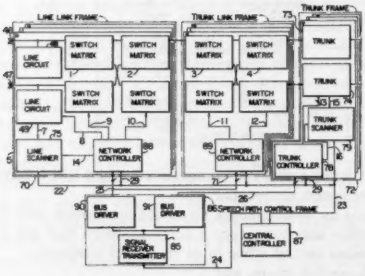
1. Method for reducing crosstalk between adjacent channels in a time division multiplex system which transmits code words each including at least one polarity bit and a plurality of amplitude-representing bits, comprising the steps of changing, on the sender side, analog signals to sets of parallel digital signals, each set having a polarity bit and a plurality of amplitude-representing bits, converting the sets of parallel digital signals to sets of serial digital signals, transmitting sequentially the sets of serial digital signals, converting, at the receiver side, the sets of serial digital signals to sets of parallel digital signals, changing the sets of parallel digital signals to analog signals, and inverting the polarity bit and maintaining the amplitude-representing bits in every other set during at least one of said converting steps.

4,113,988

SPEECH PATH PACKAGING UNIT INCLUDING CONTROLLER CONTAINING SHIFT REGISTER

Takuji Mukaemachi; Tetsuo Takeshita, both of Yokohama, and Shiroh Enami, Hiratsuka, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 8, 1977, Ser. No. 775,619
Claims priority, application Japan, Mar. 10, 1976, 51-25112
Int. Cl.² H04Q 3/54
U.S. Cl. 179—18 ES **3 Claims**



1. A speeth path apparatus for space-division type electronic exchange equipment comprising:

a plurality of speech path equipment each having controlled points, said speech path equipments being divided into packaging units;

controllers, each provided at a respective one of said packaging units, each one of said controllers including

shift register means for receiving control information sent from a central processing unit in serial form and storing said control information,

means, connected to said shift register means, for determining whether the received control information is for its own unit, and

decoder means, connected to said shift register means and controlled by the output of said determining means, for translating said control information and converting it to a parallel signal; and

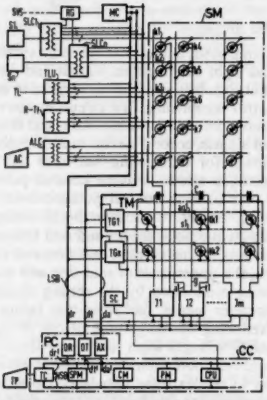
signal lines connecting said controlled points with the output of said decoder means.

4,113,989

ELECTRONIC TELEPHONE SYSTEM FEATURING SWITCHING NETWORKS HAVING THYRISTORS FOR SINGLE-WIRE SWITCHING

Carl Michael Schneider, Cinnaminson, N.J., assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 1, 1977, Ser. No. 773,318
Int. Cl.² H04Q 3/52
U.S. Cl. 179—18 GF **1 Claim**



1. In an electronic telephone switching system having peripheral units for carrying signals between subscribers, said peripheral units including a plurality of trunk and tie line circuits, at least one attendant line circuit, a plurality of signaling tone receivers and a plurality of link control circuits, having a plurality of tone generators for placing signal tones on said peripheral units, having speech path and tone switching matrices connected to and operable to interconnect said peripheral units and no interconnect said tone generators with through-connections between said peripheral units, having central control means constituted by a plurality of components including a central processing unit, a program memory connected to said central processing unit, a customer memory connected to said central processing unit, and a scratch pad memory connected to said central processing unit, having system timing means connected to said central processing unit, and having bus lines interconnecting the components of said central control means and other bus lines for connecting said peripheral units to said central control means, the improvement comprising:

said speech path and tone switching matrices being constructed utilizing, respectively, a 4×4×2 crosspoint matrix;

a plurality of electronic crosspoint switch means, each of

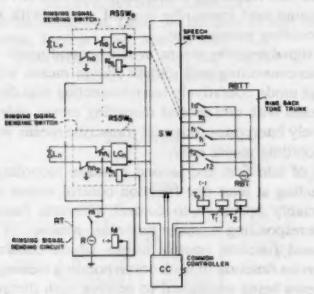
said switch means being assigned to a respective matrix crosspoint, each of said switch means comprising a pair of thyristors, the control terminals of which are, respectively, connected to common column and common row select lines, the conducting paths of said pair of thyristors being connected, respectively, between differing row and column lines at a given crosspoint; and

zener diodes for separate marking of each of said thyristors in said pairs thereby avoiding crosstalk between connections.

4,113,990
SIGNAL SENDING CONTROL SYSTEM

Shoji Nojiri; Hisao Kanzaki, both of Montebello, Calif.; Nobuyuki Yasoshima, Zama, Japan; Yasuo Satake, and Kenichi Ogawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 19, 1977, Ser. No. 788,971
Claims priority, application Japan, Apr. 24, 1976, 51-46899
Int. Cl.[2] H04M *3/04*
U.S. Cl. 179—84 R **17 Claims**



1. A signal sending control system for controlling the sending of signals via a plurality of subscriber lines, each subscriber line having a corresponding telephone connected thereto, said system comprising:

a ringing signal sending circuit including a signal source for generating a continuous ringing signal, and interrupting means provided in common to said plurality of subscriber lines, for controlling transmission of the ringing signal over said each subscriber line;

switching means, one for each subscriber line, for selectively and switchably connecting said each subscriber line to a speech network of an exchange and to the ringing signal sending circuit;

a common controller for providing control information as to transmission and cessation of the ringing signal, and required timing thereof; and

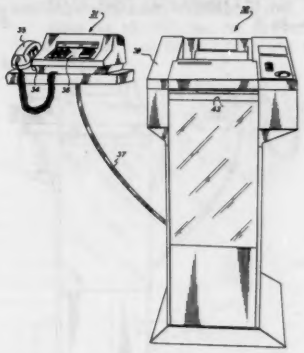
control means for individually controlling the switching means of each subscriber line in accordance with said control information to transmit the ringing signal at said required timing and for controlling the interrupting means of the ringing signal sending circuit to cease the transmission of the ringing signal at the time of switching of any one of the switching means.

4,113,991
AUTOMATIC DIALER HAVING A SELECTIVE RETRY CAPABILITY

Michael L. Gorham, Plano, Tex., and Roger F. Norian, Norwalk, Conn., assignors to Xerox Corporation, Stamford, Conn.

Filed May 3, 1977, Ser. No. 793,454
Int. Cl.[2] H04M *1/42;* H04L *11/15*
U.S. Cl. 179—90 B **5 Claims**

1. In an automatic telephone dialer for placing an outgoing telephone call from a terminal having a raster input scanner in accordance with dialing instructions identified by mark sense indicia carried in a two dimensional field by an address card scanned by said scanner, the improvement comprising means

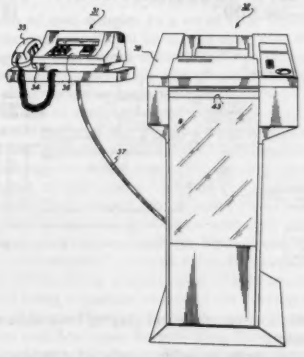


for detecting a busy back signal, means responsive to the detection of said signal for automatically attempting to replace said call after a predetermined delay, and means for at least temporally suspending further operation of said scanner pending successful placement of said call.

4,113,992
AUTOMATIC DIALER FOR FACSIMILE TERMINALS AND THE LIKE

Michael L. Gorham, Plano; Raymond F. Heckman, Richardson, and Charles S. Yole, Plano, all of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed May 3, 1977, Ser. No. 793,453
Int. Cl.[2] H04M *1/42;* H04L *11/15*
U.S. Cl. 179—90 B **5 Claims**



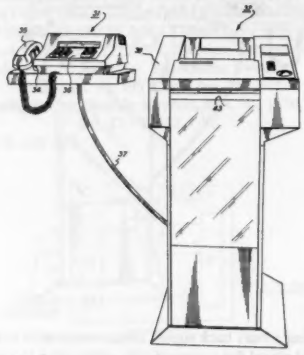
1. In combination with a telephone linked communications terminal having a raster input scanner, the improvement comprising automatic dialer means for automatically placing outgoing telephone calls from said terminal in response to dialing control instructions identified by mark sense indicia entered in a two dimensional field on address cards read by said scanner.

4,113,993

AUTOMATIC DIALER HAVING A RECALL MEMORY

Raymond F. Heckman, Richardson, and John D. Torpie, Dallas, both of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed May 3, 1977, Ser. No. 793,455
Int. Cl.[2] H04M *1/42*; H04L *11/15*
U.S. Cl. 179—90 B **5 Claims**



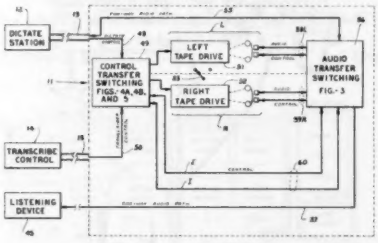
1. In combination with a telephone linked communications terminal having a raster input scanner, and an automatic dialer means for placing outgoing telephone calls from said terminal in response to dialing control instructions identified by mark sense indicia entered on address cards read by said scanner; the improvement comprising storage means for storing data identifying any jobs aborted by said automatic dialer means, and data generating means coupled between said scanner and said storage means for generating at least a part of said data in response to a video output signal supplied by said scanner whenever an address card is being scanned.

4,113,994

DICTATION RECORDING AND TRANSCRIBING SYSTEM UTILIZING SELECTABLE DUAL MESSAGE RECORD-PLAYBACK APPARATUS

Fred C. Bolick, Jr., and Theodore Titus IV, both of Atlanta, Ga., assignors to Lanier Business Products, Inc., Atlanta, Ga.

Filed Sep. 1, 1976, Ser. No. 719,423
Int. Cl.[2] H04M *11/10*; G11B *27/10*
U.S. Cl. 179—100.1 DR **15 Claims**



1. Apparatus for recording and playing back dictated messages, comprising:

dictate station means including a means for producing message signals and a means for producing dictation control signals;

dictation receiving means remotely situated from said dictate station means;

signal transmission means interconnecting said dictate station and said dictation receiving means;

said dictation receiving means including first and second recording means either of which is selectably operative for recording and playing back dictated messages received along said signal transmission means from said dictate station means;

each of said recording means being operative to receive a separate message recording medium for said recorded messages;

each of said recording means being selectably operative in a dictation mode for recording dictated messages received over said signal transmission means from said dictate station and for playing back said dictated messages to said dictate station, and in a transcribe mode for playing back previously recorded messages;

transcribe control means selectably operative to produce transcribe control signals for playing back messages previously recorded by either of said recording means; and

signal transfer means associated with said dictation receiving means and selectably operative to eiter a first mode or a second mode;

said signal transfer means in said first mode operatively interconnecting said dictate station control means with said first recording means only, and operatively interconnecting said transcribe control means with said second recording means only;

said signal transfer means in said second mode operatively interconnecting said dictate station means with said second mode operatively interconnecting said dictate station means with said second recording means only and operatively interconnecting said transcribe means with said first recording means only;

each of said first and second message recording means including at least one function control means which is selectably operative to control a certain function of the corresponding message recording means;

the said function control means which control the same certain function of each corresponding message recording means being connected to receive both dictation control signals and transcribe control signals which require said same certain function;

each of said function control means being conditioned by a first kind of transfer signal to respond only to said dictation control signals and being conditioned by a second kind of transfer signal to respond only to said transcribe control signals; and

said transfer means in said first mode supplying said first kind of transfer signals to said function control means of said first message recording means and supplying said second kind of transfer signal to said function control means of said second message recording means, and in said second mode supplying said second kind of transfer signal to said function control means of said first message recording means and supplying said first kind of transfer signal to said function control means of said second message recording means.

4,113,995

TELEPHONE CRADLE ADAPTER

Thomas L. Marks, P.O. Box 746, Fordyce, Ark. 71742

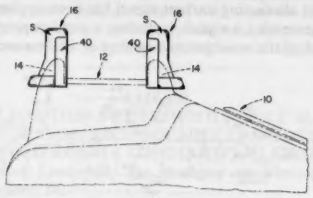
Filed Aug. 25, 1977, Ser. No. 827,623
Int. Cl.[2] H04M *1/06*
U.S. Cl. 179—146 R **4 Claims**

1. An adapter for attachment to the protuberance of a telephone cradle comprising:

an elastomeric sleeve defining a cavity for frictionally accepting the telephone cradle protuberance; and

a metallic cap engaging the elastomeric sleeve at opposite

sides of the cavity and closing one side of the cavity to form a vertically extending pocket open at the bottom for



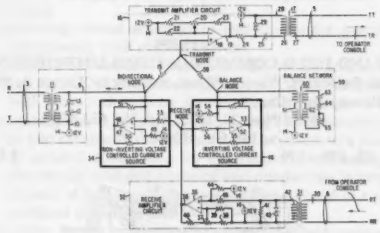
allowing the adapter to be pressed down over the telephone cradle protuberance.

4,113,996

VOLTAGE CONTROLLED CURRENT SOURCES FOR ACTIVE HYBRID CIRCUIT

Richard Barton Sanderson, Lisle, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 20, 1977, Ser. No. 798,787
Int. Cl.² H04B 1/58
U.S. Cl. 179—170 NC **18 Claims**



5. Hybrid circuitry for coupling a bidirectional path to an incoming and an outgoing path of an active hybrid circuit including:

a transmit and a receive amplifier each having at least one input and an output;

first means for connecting said output of said transmit amplifier to said outgoing path;

second means for connecting said incoming path to said at least one input of said receive amplifier;

an electrical network having a first termination communicating with said bidirectional path, a second termination connected to said output of said receive amplifier, a third termination connected to said at least one input of said transmit amplifier and being responsive to transmit signals applied to said first termination from said bidirectional path for producing said transmit signals on said outgoing path and a fourth termination for network balance;

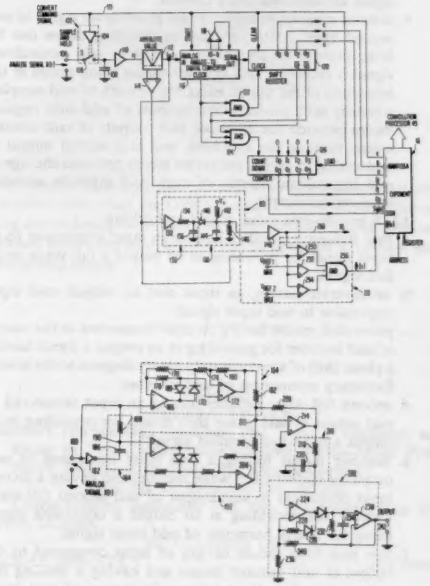
a high impedance current source means connected to said first termination and responsive to a receipt of voltage signals applied to said second termination from said output of said receive amplifier for supplying current through said first termination to produce a prescribed magnitude of the received signal on said bidirectional path; and means including said fourth termination responsive to said receipt of said voltage signals applied to said second termination for producing an inverted voltage signal at said third termination to cancel from said transmit amplifier output said signals from said receive amplifier output.

4,113,997

ANALOG TO DIGITAL SIGNAL OF LOGARITHMIC FORMAT CONVERTER AND ANALOG TO PSEUDO-RMS VALUE CONVERTER AND ECHO CANCELLER UTILIZING SAME

Otakar Anthony Horna, Bethesda, Md., assignor to Communications Satellite, Corporation, Washington, D.C.

Filed Jul. 12, 1977, Ser. No. 814,942
Int. Cl.² H04B 3/20; G01R 1/02; H03K 13/00
U.S. Cl. 179—170.2 **13 Claims**



9. A circuit for converting a fixed number of samples $x_1 \ldots x_r \ldots x_n$ of a signal into a logarithmic format having sign, exponent and mantissa, said circuit comprising:

a. analog-to-digital converter means responsive to said samples $x_1 \ldots x_r \ldots x_n$ of said signal for digitally encoding each of said samples to a serial code arranged in order from most significant bit to least significant bit, for outputing at a first output each of said bits of each said serial code individually while also providing a control signal at a clock output corresponding to the outputing of each of said bits of each said serial code, and for providing at a second output a logical signal indicating the sign of each of said digitally encoded most recent samples;

b. shift register means connected at a first input to said first output of said analog-to-digital converter means for receiving each of said bits of each of said serial code outputed by said analog-to-digital converter means, for storing each of said received bits when a corresponding store signal is received at a clock input, for providing a plurality of non-inverting outputs, each of said non-inverting outputs being connected to one of the corresponding plurality of stages of said shift register means immediately adjacent said first input, for providing first and second inverting outputs, said first and second inverting outputs being connected to the two stages of said shift register means most remote from said first input;

c. a first logic control means responsive to said control signal at said clock output of said analog-to-digital converter means and responsive to a logical one bit at said first inverting output of said shift register means for pro-

viding said store signal to said clock input of said shift register means when said control signal and a logical one bit at said first inverting output are simultaneously present;

d. a second logic control means responsive to a logical one bit at both said first and said second inverting outputs of said shift register means and responsive to said control signal at said clock output of said analog-to-digital converter means for providing a countdown signal each time a logical one bit at said first inverting output and a logical one bit at said second inverting output and said control signal are simultaneously present;

e. counter means reponsive to said countdown signal of said second logic control means for counting down one bit from present binary value each time said countdown signal is received, said counter means being preset at the beginning of the digital encoding of each of said samples, whereby said non-inverting outputs of said shift register means provide the mantissa, said outputs of said counter means provide the exponent, and said second output of said analog-to-digital converter means provides the sign of said logarithmic format of each said digitally encoded most recent sample.

12. A pseudo-rms value circuit comprising:

a. first full-wave rectifier having an input responsive to an input signal for providing at an output a full-wave rectified signal;

b. an inverter having an input and an output, said input responsive to said input signal;

c. phase shift means having an input connected to the output of said inverter for providing at an output a signal having a phase shift of approximately ninety degrees to the lowest frequency component of said inverter;

d. second full-wave rectifier having an input connected to said output of said phase shift means for providing at an output a full-wave rectified signal;

e. summer means having a first input connected to said output of said first full-wave rectifier and having a second input connected to said output of said second full-wave rectifier for providing at an output a composite signal being the fourth harmonic of said input signal;

f. low pass filter means having an input connected to the output of said summer means and having a limiting frequency less than the minimum frequency of said input signal and having an integration time constant equal to the inverse of said limiting frequency for providing at an output a signal in which all frequencies greater than the minimum frequency of said input signal are substantially attenuated; and

g. peak detector means having an input connected to said output of said low pass filter means and having a release time constant substantially longer than said integration time constant of said low pass filter for providing at an output a signal averaging a greater value than said signal at said output of said low pass filter means, whereby the signal at said output of said peak detector means is the pseudo-rms value of the analog voltage.

4,113,998

TESTING ELECTRICALLY CONDUCTIVE LINES TO DETERMINE ELECTRICAL CHARACTERISTICS THEREOF

Glynn R. Ashdown, Hawthorn Woods; Thomas McCartney, Deerfield, both of Ill., and Bruce Holmes, Twickenman, England, assignors to Teradyne, Inc., Boston, Mass.

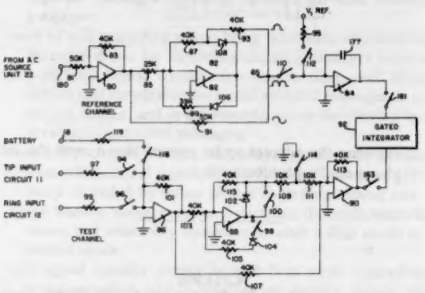
Filed Oct. 14, 1975, Ser. No. 622,054
Int. Cl.[2] H04B 3/46
U.S. Cl. 179—175.3 R **47 Claims**

1. A method for testing two-wire lines in an environment where the predominant power distribution is at a frequency f_1, to determine the electrical characteristics thereof comprising the steps of,

(a) applying an alternating current waveform of specified frequency to one of said wires, said frequency being substantially $\frac{1}{2} f_1$, a submultiple thereof or an odd harmonic thereof no greater than 250 Hz,

(b) measuring the current on the one of said wires to which said alternating current signal has been applied,

(c) generating a signal, including a portion proportional to and of the same polarity as that of said measured current



for a period equal to an integer number of half cycles of said applied alternating current signal and equal to an integer number of full cycles of f_1,

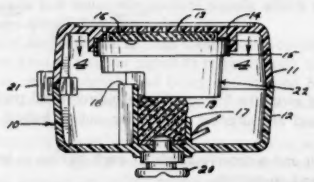
(d) and providing an output signal proportional to the integrated value of said generated signal over said period, said period being selected to be in a known phase relationship with said applied alternating current signal.

4,113,999

HAND HELD COMMUNICATIONS MICROPHONE

Frank Swinehart, Waseca, Minn., assignor to Warren A. Sturm, Minneapolis, Minn.

Filed Nov. 20, 1975, Ser. No. 633,870
Int. Cl.[2] H04R 1/02
U.S. Cl. 179—179 **1 Claim**



1. The combination in a microphone comprising:

a hollow housing, top and bottom major surfaces in said housing;

an aperture on said top surface for receiving sound energy and transmitting sound energy into said housing;

receiver means internal to said housing and in communication with said aperture comprising a case having an open top, a ceramic transducing means internal to said case, a plastic diaphragm supported in said case and connected to said transducing means, a damping element having a plurality of apertures disposed underneath said diaphragm, said plurality of apertures of said damping element covered by porous damping material;

open cellular foam plastic material disposed between said apertures and said receiver means;

a moisture impervious material loosely disposed between said open cellular material and said receiver means and means sealing said membrane over a top of said plastic diaphragm;

a stop means on said bottom surface for limiting maximum displacement of said receiver means disposed between said surfaces; and,

resilient mounting rubber gasket means disposed about said aperture surrounding a top of said receiver means and resilient mounting means opposite said aperture on said bottom surface being disposed within said stop means.

4,114,000

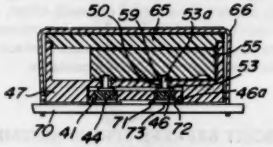
MULTI-POSITION SWITCH WITH SINGLE SLIDING ACTUATOR CAM, RECIPROCABLE CAM FOLLOWER AND COMPRESSIVE CONDUCTIVE ELASTOMER

Alvin Feder, Lauderhill, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 554,860, Mar. 3, 1975, abandoned. This application May 25, 1977, Ser. No. 800,245

Int. Cl.[2] H01H *15/02, 1/02*

U.S. Cl. 200—16 R **21 Claims**



1. A multiple position switch for selectively interconnecting a plurality of isolated conductors, including:

a casing;

positioning means attached to said casing for positioning components with respect thereto;

a plurality of conductive means flexibly joined to said casing and located in relatively fixed predetermined positions with respect thereto by said positioning means;

mounting means coupled to said casing for positioning each of said conductive means normally adjacent to a plurality of isolated conductors for conductively contacting and electrically bridging a pair of said conductors in response to each of said conductive means being flexed in a predetermined direction; and

actuator means mechanically contacting said casing and slideably movable in first and second linear orthogonal directions into a plurality of at least three predetermined positions with respect thereto, said actuator means including a cam surface selectively coupled to said plurality of conductive means for selectively flexing a predetermined number of said conductive means in said predetermined direction in response to said actuator means being in each of said plurality of predetermined positions.

4,114,001

ELECTRICAL SWITCH HAVING INTERLOCK BETWEEN DOOR AND SWITCH

John Courtney Corfield, Waltham St. Lawrence, England, assignor to Unimax Switch Limited, Maidenhead, England

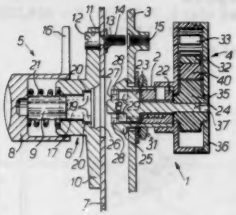
Filed Sep. 29, 1976, Ser. No. 727,849

Claims priority, application United Kingdom, Oct. 1, 1975, 40111/75

Int. Cl.[2] H01H *9/00*

U.S. Cl. 200—50 A **27 Claims**

25. In or for a machine in which the opening or removal of a machine door, cover or guard is rendered safe, a first unit which is connected to a fixed structure of said machine and which includes electrical switching means for controlling power to said machine; a second unit which is connected to said door and which includes a control knob movable between OPEN and ON positions and which is adapted to co-operate with said first unit when the door is closed so that movement of the control knob controls operation of said switching means and connects power to the machine only when in the ON position; a releasable fastening device which is mounted on said door so that it is captive thereon; cooperating means which is mounted on said fixed structure of the machine for engagement by said releasable fastening device to lock said door closed; masking means which is mounted on said control knob and is positioned in relation to said releasable fastening device so as to cooperate therewith and prevent operation of



the releasable fastening device when the control knob is in any position other than the OPEN position; said releasable fastening device being such that it has to be operated to lock the door closed before the control knob can be operated to control said switching means.

4,114,002

ELECTRIC SWITCH

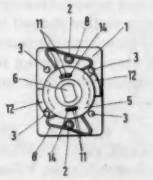
Gerhard Hochgesang, Lebenhan, Fed. Rep. of Germany, assignor to Preh-Elektrofeinmechanische Werke-Jakob Preh Nachf, Bad Neustadt, Saale, Fed. Rep. of Germany

Filed Jul. 21, 1976, Ser. No. 707,337

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536603

Int. Cl.[2] H01H *1/24*

U.S. Cl. 200—67 C **12 Claims**

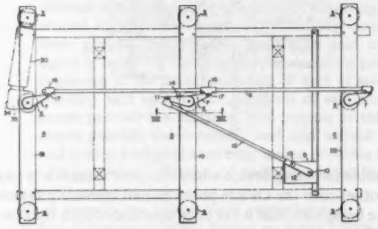


1. In an electrical switch having a single-piece contact element pivoted about a middle contact block and made of electrically-conductive material, said contact element being brought selectively into or out of contact with stationary contact blocks in two switch positions by means of an actuating element, wherein the contact element simultaneously serves to produce a snap action movement, the improvement comprising said contact element comprising a contact spring formed approximately in the shape of a triangle and open at one apex of the triangle, said contact spring having a bearing in the center of the side thereof opposite the open apex for engaging said middle contact block, a second side of the contact spring, in a first switch position, bearing under spring tension against one stationary contact block disposed on one side of the middle contact block, a third side of the contact spring, in a second switch position, bearing under spring tension against another stationary contact block disposed on another side of the middle contact block, said actuating element having a recess therein, the free ends of the second and third sides of the contact spring, at the open apex thereof, engaging in said recess.

4,114,003
QUICK-ACTING MOVABLE OPERATING-COLUMN TRIPPING DEVICE

Russell E. Frink, Pittsburgh, and Stanislaw A. Milianowicz, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 8, 1974, Ser. No. 468,332
Int. Cl.[2] H01H *33/02*
U.S. Cl. 200—144 R **22 Claims**

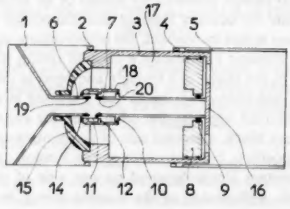


1. The combination in a circuit-breaker structure of an interrupting unit disposed at high potential and having separable contact means associated therewith, insulating means for supporting said interrupting unit up in the air an adequate distance above ground potential, operating means at high voltage disposed adjacent one end of said high-potential interrupting unit for causing the actuation of said separable contact means associated with said high-potential interrupting unit, means providing an operating mechanism at ground potential, a movable insulating column for transmitting motion from said grounded operating mechanism to the high-voltage operating means for the high-voltage separable contact means, a high-speed, spring-charged tripping device interposed between the aforesaid high-potential operating means and the aforesaid grounded operating mechanism and constituting a separate independent entity from the aforesaid two operating means, said high-speed independent spring-charged tripping device being associated with said movable insulating column to cause thereby the fast tripping motion thereof independently of the action of the relatively-slow-acting grounded operating mechanism for consequent very-fast tripping separating motion of the separable contact means within the interrupting unit.

4,114,004
GAS-BLAST ELECTRIC CUT-OUT DEVICE

Jacques Dayet, Lyon; Joseph Martin, Villeurbanne, and Charles Nicola, Meyzieu, all of France, assignors to Delle-Alsthom S.A., Villeurbanne, France

Filed Sep. 29, 1976, Ser. No. 727,750
Claims priority, application France, Oct. 9, 1975, 75 30996
Int. Cl.[2] H01H *33/88*
U.S. Cl. 200—148 A **11 Claims**

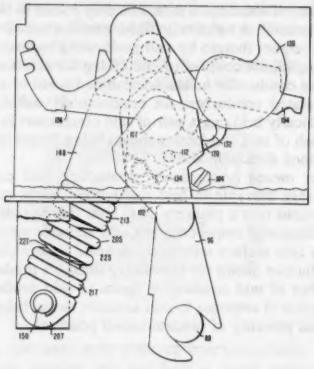


1. An electric cut-out device comprising:
a main fixed contact,
a main mobile contact,
a fixed arcing cut-out contact,
a mobile arcing cut-out contact,
means for compressing a blast gas used for extinguishing the arc which forms between the arcing contacts upon cut-out operation, said arcing cut-out contacts being tubular and being provided with nozzles opposing each other for contact therebetween and being of the same diameter,
means for maintaining said arcing cut-out contacts open when said main contacts are closed prior to cut-out device cut-out operation, and
maneuvering means for effecting when the cut-out device opens, a first movement of the mobile arcing cut-out contact, in the opposite direction to the movement of the mobile main contact and towards said fixed arcing cut-out contact, until the mobile arcing cut-out contact presses against the fixed arcing cut-out contact, then holding of the arcing cut-out contacts closed as long as the main contacts are not separated from each other, and lastly, a second movement of the mobile arcing cut-out contact, in the same direction as the mobile main contact, a short time after the separation of the main contacts.

4,114,005
CIRCUIT BREAKER SPRING ASSEMBLY

Alfred E. Maier, Chippewa; Donald D. Armstrong, Pittsburgh, and James R. Farley, Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1977, Ser. No. 829,702
Int. Cl.[2] H01H *3/60*
U.S. Cl. 200—153 G **6 Claims**



1. A circuit breaker comprising:
stationary contact means;
a movable contact operable between open and closed positions with respect to said stationary contact means;
a support;
movement effecting means for effecting relative movement of said movable contact between said open and closed positions; and
a closing spring assembly for imparting movement to said movement effecting means to move said movable contact to said closed position, said closing spring assembly capable of being in spring charged and spring discharged positions, said closing spring assembly comprising:
a first member having first and second end sections, said first member first end section being secured to said support;
a second member having first and second end sections, said second member first end section being coupled to said movement effecting means;
a helical closing spring, having a central opening therethrough, secured to said first member second end section and said second member second end section, said first member second end section and said second member

second end section extending within said closing spring central opening; and

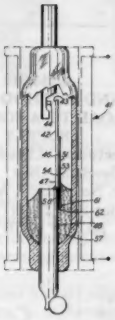
shock absorbing means disposed within said closing spring central opening intermediate said first and second member second end sections for absorbing energy released when said closing spring assembly is discharged.

4,114,006

MERCURY-WETTED SEALED CONTACT SWITCH

Anthony Tedeschi, Raytown, Mo., assignor to Western Electric Co., Inc., New York, N.Y.

Filed May 3, 1977, Ser. No. 793,325
Int. Cl.[2] H01H *1/08, 1/26*
U.S. Cl. 200—234 **4 Claims**



4. An electrical switch comprising: first and second terminals mounted in a sealed envelope; an elastically flexible member attached at one end to the first terminal and extending therefrom;

an armature attached at one end to the flexible member and located generally between the terminals, the other end of the armature remaining unattached to permit the armature to pivot about a center of flexure of the member into and out of electrical contact with the second terminal, the center of flexure being located substantially at the midpoint between the attachments of the flexible member to the first terminal and to the armature;

a damping member mounted on said flexible member and shaped to be substantially superimposed on and parallel to the flexible member and extending part the one end of the armature toward and past the center of the flexure, the damping member having a flat end surface located on the opposite side of the center of flexure with respect to the unattached end of the armature; and

a damping liquid located in said envelope at the first terminal, the damping member extending into the liquid to exert a force on the liquid in response to a force transmitted from the armature to the damping member.

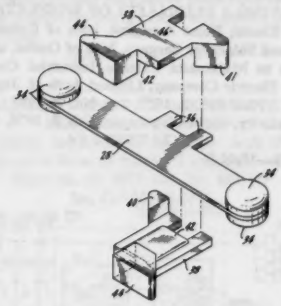
4,114,007

LOW LEVEL RELAY CONTACT BLADES

Angelo C. Desiderio, Crystal Lake, Ill., assignor to Oak Industries, Incorporated, Crystal Lake, Ill.

Filed Jan. 3, 1977, Ser. No. 756,247
Int. Cl.[2] H01H *1/24*
U.S. Cl. 200—246 **4 Claims**

1. In a relay assembly, a housing, a contact carrier yieldingly mounted in said housing, a plurality of terminals having contact portions thereon positioned in said housing, a flat flexible contact blade having contact portions thereon, a pair of spaced projections extending laterally outwardly from said blade, means for mounting said contact blade on said contact carrier in position for closing with said terminals, said mounting means including support means interposed between said carrier and blade and permitting flexing of said blade and wiping of said terminal contact portions by said blade contact portions as said blade opens and closes upon said terminals in response to movement of said carrier, said support means being interlocked with said blade and including symmetrically arranged blade support blocks, one positioned on each side of said blade, with said blocks and blade being positioned as a unit



within a groove in said contact carrier, an outwardly extending ear on each block, with said ears being positioned outwardly of and adjacent a blade projection whereby said blade is held between said ears, each of said support blocks having a raised portion with the flat blade being captured between said raised portions permitting flexing movement of said blade relative to said blocks.

4,114,008

RELAY SEAL CAP

Edwin J. Luetzow, Northfield, Minn., assignor to TelTec, Incorporated, Farmington, Minn.

Filed Jun. 14, 1976, Ser. No. 695,514
Int. Cl.[2] H01R *9/04*
U.S. Cl. 29—630 B **4 Claims**

4. A method of sealing generally rigid rectangular cross-sectioned contact pins within an enclosure wall having an interior surface and an exterior surface which comprises the steps of:

(a) forming at least one contact pin receiving bore within a thermoplastic enclosure wall, said bore extending a predetermined distance into said wall from said interior surface and having a tapered end thereon terminating a second predetermined distance short of the exterior surface of said enclosure wall, there being a slit, having a transverse dimension less than the corresponding transverse dimension of the contact pin to be received therethrough, extending from the apex of said tapered end of said bore to said exterior surface of said wall;

(b) inserting a generally rigid contact pin into said bore with a portion thereof extending through said slit beyond said exterior surface of said wall, with the edges of said slit being in resilient engagement with the lateral edges of said generally rigid contact pin to form a lip seal thereabout; and

(c) heating said generally rigid contact pin extension to a

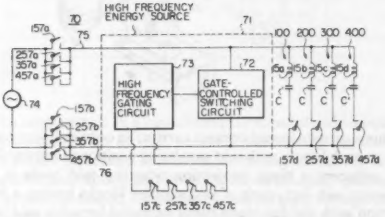
temperature sufficient to cause the material forming said thermoplastic wall to flow, thereby forming a seal about the edges of said generally rigid contact pin.

4,114,009

SWITCHING AND HEAT CONTROL MECHANISM FOR INDUCTION HEATING COOKING APPARATUS HAVING A PLURALITY OF WORK COILS

Mitsuyuki Kiuchi; Keizo Amagami, both of Kadoma; Shigeru Maeda, and Shigeharu Saegusa, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. and Kyokuto Electric Company, Limited, both of, Japan

Filed Feb. 2, 1977, Ser. No. 764,983
Claims priority, application Japan, Feb. 3, 1976, 51-11032
Int. Cl.[2] H05B 5/04
U.S. Cl. 219—10.49 R **10 Claims**



1. Induction heating cooking apparatus having a nonmetallic cook top on which cooking vessels are adapted to be placed, comprising a gate-controlled switching circuit, a high frequency gating circuit for gating on said gate-controlled switching circuit into conduction successively in opposite directions at the high frequency rate, a plurality of commutation circuits each including an induction heating coil and a capacitor connected in series, and a switching and heat control mechanism for each of said commutation circuits, the switching and heat control mechanism comprising:

(a) an elevating mechanism mounted on a chassis for carrying an associated induction heating coil at an adjustable position relative to said cook top;

(b) a switching device comprising:

(1) a rotary shaft;

(2) a control knob connected to one end of said shaft;

(3) first, second and third switch contact units, the first contact unit being arranged to connect said gate-controlled switching circuit to be responsive to power derived from a low frequency alternating voltage source in parallel with the first switch contact units of the other switching and heat control mechanisms, the second contact unit being arranged to connect an associated commutation circuit to said gate-controlled switching circuit, the third switch contact unit being connected in series with the third switch contact units of the other switching and heat control mechanisms to control the energization of said high frequency gating circuit; and

(4) first, second and third contact operating members mounted along the length of said shaft at such positions as to engage the first, second and third switch contact units respectively to allow the same to assume one of open and closed circuit conditions, the points of engagement of said first and second contact operating members with the corresponding switch contact units being axially aligned with each other and the point of engagement of said third contact operating member with the corresponding switch contact unit being angularly displaced from the points of engagement of said first and second contact operating members, wherein the points of engagement of the first, second and third contact operating members are positioned to allow the corresponding switch contact units to assume one of different combinations of open and closed circuit conditions in sequence as the shaft is rotated from a normal position in which the associated induction heating coil is inactive;

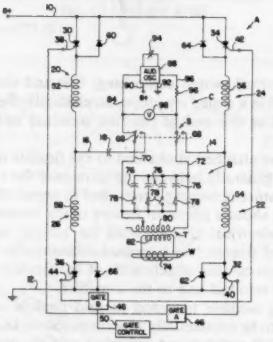
(c) means connected at one end to said shaft for translating the rotational movement of said rotary shaft into a reciprocating movement and connected at the other end to said elevating mechanism to transmit the reciprocating movement thereto to thereby cause it to move the associated induction heating coil relative to said cook top, the connection thereof to said rotary shaft being such that when said shaft is in the normal position the gap between the associated induction heating coil and the cook top is at the greatest.

4,114,010

TEST CIRCUIT AND METHOD FOR MATCHING AN INDUCTION LOAD TO A SOLID STATE POWER SUPPLY

John C. Lewis, Wentworth, Canada, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Continuation of Ser. No. 668,952, Mar. 22, 1976, abandoned.
This application Sep. 21, 1977, Ser. No. 835,157
Int. Cl.[2] H05B 5/04
U.S. Cl. 219—10.41 **9 Claims**

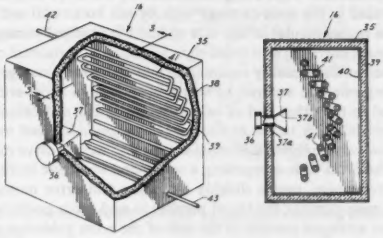


1. An auxiliary electrical test circuit for induction heating apparatus including a load circuit comprising inductor means and power factor correction means, and a solid state power supply circuit having an output connected to said load circuit and having a rated output frequency, said power supply circuit being inoperable to deliver any power through said output to said load circuit when the resonant frequency of said load circuit when loaded is outside said rated output frequency of said power supply circuit, said test circuit including audio frequency oscillator means having an output frequency adjustable between lower and upper limits respectively below and above said rated output frequency of said power supply circuit, means for selectively coupling said test circuit with said load circuit independent of said power supply circuit, said inductor means being adapted to be inductively coupled with a workpiece, and means responsive to adjustments of said output frequency of said oscillator means for indicating an oscillator output frequency corresponding to the resonant frequency of said load circuit with a workpiece inductively coupled with said inductor means whereby said resonant frequency of said load circuit with said workpiece inductively coupled therewith can be matched with said rated output frequency of said power supply circuit prior to connecting said power supply circuit output with said load circuit.

4,114,011
MICROWAVE HEATING METHOD AND APPARATUS

Elmer L. Stubbs, Colorado Springs, Colo., assignor to Thermatron, Inc., Denver, Colo.

Filed Jul. 12, 1976, Ser. No. 704,520
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 M 6 Claims



1. Microwave heating apparatus for heating a room and the like comprising:

means for generating microwave energy having a wave guide for directing said energy;

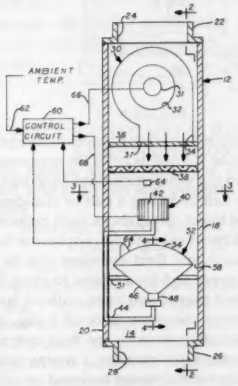
means defining a chamber having microwave energy reflecting wall surfaces for containing the microwave energy generated by said generating means and having heat insulation; and

pipe means in said chamber that are permeable to microwave energy for conveying a microwave energy absorbent liquid capable of directly absorbing and being heated by said microwave energy, said pipe means being in the form of a plurality of pipe sections arranged in a generally parabolic array in said chamber with said generating means located at approximately the focal point of said array and with said wall surfaces reflecting microwave energy to said liquid to enhance the absorption of said microwave energy by said liquid to heat said liquid as said liquid is passed through said chamber.

4,114,012
MICROWAVE FURNACE

George E. Moen, 1876 Miramonte Ave., Mountain View, Calif. 94040, and Vincent P. De Vito, 3716 Atwater, Sacramento, Calif. 95825

Filed Jul. 25, 1977, Ser. No. 818,384
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 R 4 Claims

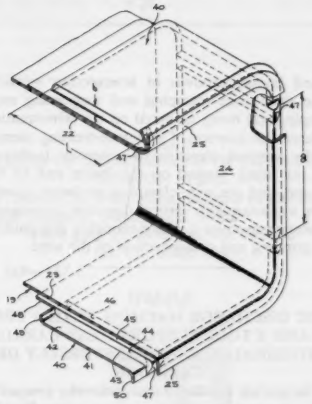


1. A furnace comprising an impervious housing having an inlet opening and an outlet opening spaced from the inlet opening, means for inducing air flow along a path through said housing from said inlet opening to said outlet opening, heat exchanger means disposed within said housing for heating the air flowing therethrough from said inlet opening to said outlet opening, said heat exchanger means including a body having a wall that is microwave lossy, a microwave source and a transmission line between said microwave source and said body for transmitting microwave energy from said source to said body to heat the body.

4,114,013
CHOKE FOR COMBINED MICROWAVE AND SELF-CLEANING OVEN

Donald J. Simon, and Louis H. Fitzmayer, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jul. 28, 1977, Ser. No. 819,789
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 D 9 Claims



1. A combined microwave and self-cleaning oven including an oven liner having an opening, said liner having a lip surrounding the periphery of said opening, means to produce microwave energy of a selected wavelength within said liner, a door having sealing means engaging said lip when said door is in its closed position to seal said opening, a choke surrounding said liner adjacent said lip, said choke including a cavity with means to trap air therein to thermally insulate said liner adjacent said lip during pyrolytic self-cleaning of said liner, and to provide groundpoints.

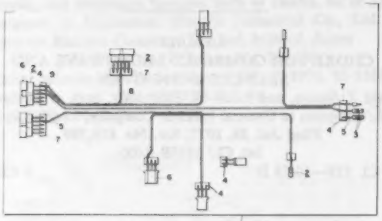
4,114,014
PROCESS AND APPARATUS FOR PRODUCING A WIRE-HARNESS

Iizuka Shogo; Endo Mitsuo, both of Gotenba; Watanabe Mitsugu; Iizuka Toshio, both of Numazu, and Usui Kenji, Gotenba, all of Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Oct. 29, 1976, Ser. No. 737,025
Claims priority, application Japan, Oct. 30, 1975, 50-129829; Mar. 24, 1976, 51-031404
Int. Cl.[2] B23K 11/00
U.S. Cl. 219—56 18 Claims

1. An apparatus for producing a wire-harness comprising a working stand, X and Y shafts mounted on the working stand to cross each other, said X and Y shafts being separately rotatable on the working stand, a wire-laying head connected to said X and Y shafts and movable above the working stand by said X and Y shafts, said wire-laying head comprising a wire-inserting ram, a wire clamp and a wire guide, a wire reel station

disposed on one side of the working stand, a device for cutting a wire and removing an insulating coating from the cut end of the wire, a plurality of sets of wire clamping and supporting members, lower welding electrodes mounted on the working stand in close relation to each other, and upper welding electrodes movable toward and away from said lower welding electrodes, the wire-inserting ram being disposed on the lower end of a wire-treating member disposed in substantially parallel relation to the wire clamping and supporting members, longitudinal and lateral grooves in intersecting relation being formed on each wire clamping and supporting member, a wire-clamping rod being mounted on the wire-treating member to pierce the interior of the wire-treating member in a substantially vertical direction, a generally L-shaped wire-clamping pin being formed on the lower end of the wire-clamping rod, and the wire-clamping pin being rotatable and movable in a substantially vertical direction to cooperate with said intersecting grooves to effect clamping and guiding of the wire and gripping and disconnection of the wire.

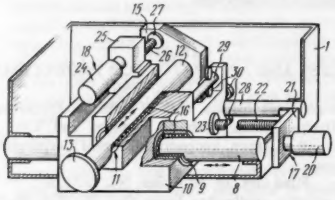


4,114,015

ELECTRIC DISCHARGE MACHINE WITH A PROGRAM COPIER AND A TOOL SUPPORT HEAD CARRIED BY A LONGITUDINALLY AND TRANSVERSELY DRIVEN CARRIAGE

Vladimir Sergeevich Vasiliev, Lomonoskovsky prospekt, 18, kv. 226; Ernest Alexandrovich Annenberg, ulitsa Shukhova, 16, korpus 4, kv. 31; Abram Lazarevich Livshits, Leninsky prospekt, 11, kv. 62; Vadim Evgenievich Polotsky, Leninsky prospekt, 70/11, kv. 238, and Valery Mikhailovich Lakhtjukhov, Profsojuznaya ulitsa, 35/11, kv. 211, all of Moscow, U.S.S.R.

Continuation of Ser. No. 579,722, May 21, 1975, abandoned.
This application Mar. 23, 1977, Ser. No. 780,357
Claims priority, application U.S.S.R., May 27, 1974, 2025822
Int. Cl.[2] B23P *1/08*
U.S. Cl. 219—69 W **3 Claims**



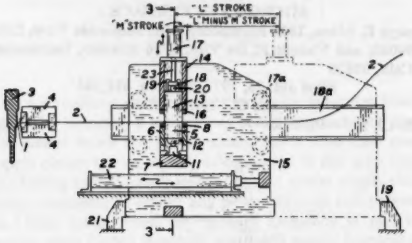
1. A metal-cutting machine comprising a base; a table mounted on said base for clamping a workpiece thereon; longitudinal ways on said base; a main carriage mounted on said longitudinal ways for longitudinal displacement thereon, said main carriage being provided with transverse ways; a cross-slide mounted in the transverse ways of said main carriage; a power head with cutting tool mounted on said cross-slide; first and second drive means for respectively driving said main carriage and cross-slide with respect to their associated ways, said second drive means being mounted on said main carriage adjacent to said main carriage; a program-copying device connected to said first and second drive means to control the same and thereby the driving of the main carriage and cross-slide, said longitudinal ways comprising a horizontal longitudinal guide-bar extending through a longitudinal passage provided in said main carriage and having ends fixed to said base, said transverse ways being constituted by a transverse passage provided in the main carriage with its axis horizontal and in a plane perpendicular to the axis of said longitudinal passage in the main carriage, said cross-slide including a horizontal cross guide-bar displaceably mounted in said transverse passage and having one end secured to said power head, a cross-arm secured to the other end of said cross guide-bar and extending perpendicularly to the axis of said cross guide-bar and means operatively coupling said cross-arm to said second drive means for the cross-slide comprising a screw-and-nut drive including a drive motor, means slidably mounting said drive motor on said main carriage for travel parallel to said cross guide-bar, a screw arranged parallel to the axis of the cross guide-bar with one of its ends drivingly connected to said drive motor, said screw being located on the main carriage on the same side of the cross-arm as the cross guide-bar, and a nut fixed in position on the cross-arm and engaged by said screw, said drive motor of the second drive means being superimposed above said cross guide-bar at an intermediate location along the length thereof and also above said longitudinal ways on said base and being confined within the outline of the carriage, said screw extending the length from the drive motor of the second drive means to said cross arm which represents only a portion of the length of said cross guide-bar.

4,114,016

WELDING MACHINE AUXILIARY TRANSFER CLAMP

Charles A. Toma, Warren, and Walter F. Haessly, Salem, both of Ohio, assignors to The Taylor-Winfield Corporation, Warren, Ohio

Filed Apr. 19, 1976, Ser. No. 678,153
Int. Cl.[2] B23K *11/04*
U.S. Cl. 219—97 **1 Claim**

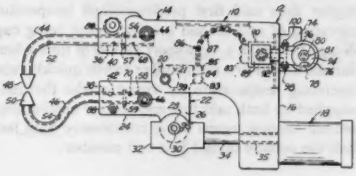


1. In a welding machine having a spacer plate against which the end of a coil, to be welded, is held; the improvement comprising a carriage on the welding machine supporting an auxiliary transfer clamp unit including a pair of clamping elements including upper and lower clamp shoes, each including a cylindrical ram operated by a fluid cylinder, a spherical ball connection intermediate each said fluid cylinders and its respective ram to allow said upper and lower rams to pivot freely only about the longitudinal axes of said rams, without lateral movement, so as to prevent the occurrence of a gap, a clamping beam which is vertically movable by fluid operated means mounted on the frame of said carriage, a wedge movable horizontally by a fluid operated cylinder mounted on said clamping beam and engageable with said ball connection of said lower ram to effect clamping movement thereof.

4,114,017
CORROSION-RESISTANT LIGHT-WEIGHT SPOT WELDING GUN

Adrian P. Smith, 51 Woodland Shore, Grosse Pointe Shores, Mich. 48236

Filed Dec. 18, 1975, Ser. No. 641,994
Int. Cl.[2] B23K *11/10*
U.S. Cl. 219—90 **5 Claims**



1. A corrosion-resistant light-weight spot-welding gun, comprising

an aluminum spot-welding gun body having a forward portion with a fixed jaw containing a fixed electrode socket and having a cooling water passageway communicating at its forward end with said fixed electrode socket and at its rearward end adapted to be connected to cooling water supply and discharge conduits,

a movable aluminum spot-welding gun jaw movably mounted on said body and having a forward portion with a movable jaw containing a movable electrode socket and having a coolng water passageway communicating with said movable socket and at its rearward end adapted to be connected to cooling water supply and discharge conduits,

said fixed and movable sockets being adapted to receive and hold hollow fixed and movable spot welding electrodes respectively communicating with said passageways,

sealing means interposed between said sockets and said passageways for excluding water from said sockets,

means on said body operatively connected to said movable jaw for moving said movable jaw toward and away from said fixed jaw whereby to move the welding electrodes into and out of welding engagement with a workpiece placed therebetween,

a bipolar welding cable connection on said body adapted to be connected to the terminal connectors of an electrical supply welding cable,

and means for conducting electricity of different polarities from said welding cable to said fixed and movable jaws respectively.

the internal surfaces of said cooling water passageways having nickel-plated corrosion resistant coatings thereon.

4,114,018
METHOD FOR ABLATING METAL WORKPIECES WITH LASER RADIATION

Martin Von Allmen, Ortschwaben, and Hans Peter Schwob, Uetendorf, both of Switzerland, assignors to Lasag AG, Thun, Switzerland

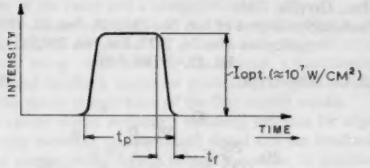
Filed Sep. 30, 1976, Ser. No. 728,403
Int. Cl.[2] B23K *27/00*
U.S. Cl. 219—121 LM **18 Claims**

1. A method of ablating a metal workpiece comprising:

establishing a beam of laser radiation having an intensity sufficient to cause vaporization and ejection of molten material created thereby but insufficient to create a plume or a plasma at a point of impingement on the workpiece;

impinging the beam on the metal workpiece to cause vaporization and ejection of the molten material;

maintaining a constant beam intensity while the beam impinges at the point of impingement on the workpiece; and

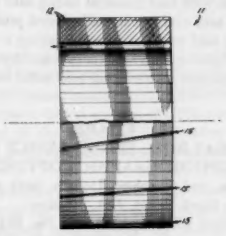


terminating the intensity of the beam at a rapid rate so that substantially no ejected molten material impinges upon the workpiece.

4,114,019
WELDING OF LAMINATIONS OF CORE-PLATED SILICON STEEL

Leslie W. Sandor, St. Paul, Minn., assignor to Electric Machinery Mfg. Company, Minneapolis, Minn.

Filed Dec. 22, 1976, Ser. No. 753,430
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—137 R **28 Claims**



1. A method of joining a plurality of metallic laminations each of which is core-plated for electrical insulating purposes to form a laminate structure of predetermined configuration, comprising:

(a) placing the core-plated laminations together face to face with portions of the lamination edges relatively disposed to define a welding surface;

(b) and arc welding a bead on the welding surface transverse to the lamination edges by

(1) continuously supplying to a movable welding head a microwire electrode having an effective cross sectional area equivalent to a circular area the diameter of which is no greater than about 0.050 inches;

(2) moving the welding head over the welding surface transversely to the lamination edges with the microwire electrode in close proximity to the welding surface;

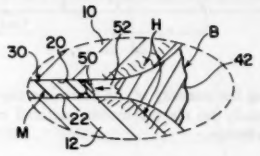
(3) and applying a voltage to the microwire electrode which results in an operating welding current of no more than about 170 amperes, whereby a substantially nonporous weld bead is deposited on the welding surface as the welding head is moved.

4,114,020

METHOD OF JOINING TWO SHEET METAL PARTS

Harry Edwin Featherstone, Wooster, and Walter Grant Sniff, Jr., Smithville, both of Ohio, assignors to Orrville Products, Inc., Orrville, Ohio

Continuation-in-part of Ser. No. 760,919, Jan. 21, 1977. This application Jun. 24, 1977, Ser. No. 809,911
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—137 R **29 Claims**



1. A method of joining first and second sheet metal parts along a common seam formed by a first surface on said first part and a second surface generally matching said first surface and on said second part, said surfaces defining therebetween random spaces of variable thickness when said surfaces are assembled in generally abutting coextensive relationship, said variable thickness being less than a known thickness, said method comprising the steps of:

(a) applying a layer of corrosion resistant material to one of said surfaces at an applied thickness substantially greater than said known thickness, said material including a suspension of a carrier, a corrosion resistant agent and a carrier solvent and being nongravity flowable at a temperature above about 400° F to 440° F and capable of forming a heat insulating, pliable, coherent gel upon burning of said solvent and being nonhardening;

(b) placing said surfaces together to jointly form said common seam with said material filling said random spaces;

(c) holding said surfaces in said placed position;

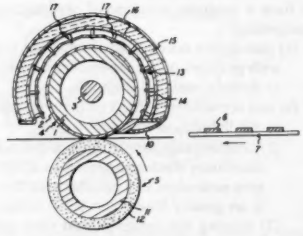
(d) welding said surfaces together along a weld line generally coextensive with said seam whereby a line of said gel of said material forms along said weld line.

4,114,021

HEAT ROLL FIXING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

Hiroo Nishide, and Yasuhiro Uehara, both of Ebina, Japan, assignors to Rank Xerox, Ltd., London

Filed May 31, 1977, Ser. No. 801,678
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—216 **4 Claims**



1. Fuser apparatus for fixing toner images to copy substrates, said apparatus comprising:

a first roll member;

a second roll member cooperating with said second roll member to form a nip through which said copy substrates pass with said toner images contacting said first roll member;

first heating means disposed internally of said first roll member for elevating the surface temperature thereof to a first predetermined level;

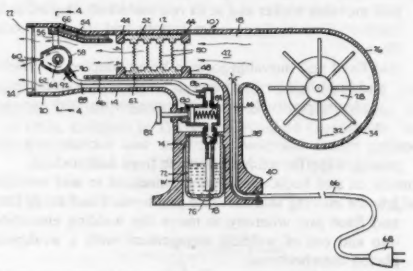
second heating means disposed externally of said first roll member and adjacent thereto, said second heating means comprising a low heat capacity element which can be elevated to a second predetermined temperature which is higher than said first predetermined temperature, said elevation of said second heating means being capable of being effected in a very short period of time whereby the surface of said first roll member can be quickly raised to its operating temperature by virtue of the thermal energy supplied by both said first and second heating means said second heating means being coextensive with more than half the surface of said first roll member.

4,114,022

COMBINED HOT AIR AND STEAM HAIR DRYER

Herbert A. Braulke, III, 7 E. 14th St., New York, N.Y. 10003

Filed Aug. 16, 1977, Ser. No. 825,185
Int. Cl.[2] H05B *1/00*; A45D *20/08*; F24H *3/04*; F22B *1/28*
U.S. Cl. 219—362 **8 Claims**

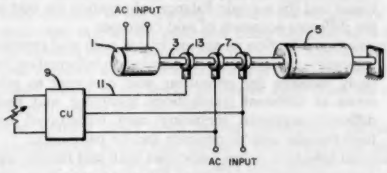


1. A combined hot air and steam hair dryer comprising a hollow housing defining an air flow chamber and provided with a support base, a fan motor disposed in the rear of the housing, a discharge aperture provided in the front of the housing, fan means driven by said motor for drawing air into the chamber through a rear air inlet of said housing and discharging the air through the front aperture, electric heating means to heat the air passing through the air chamber, a steam generating casing within the air chamber in the air flow path through said chamber downstream of said air heating means and adjacent the discharge aperture and provided with openings facing the aperture, electric heating means disposed within the casing for generating steam, a water reservoir removeably secured within the support base, a pump having an inlet communicating with the reservoir, and an outlet connected to a hollow tubing leading from the pump into the steam generating casing, means to activate the pump means to inject water from the reservoir into the casing, the electric heating means within the chamber and within the casing, and the fan motor being connected in a circuit to a lead wire engageable to an electric source, and switch means to energize the circuit, whereby hot air is discharged through the aperture and steam is selectively discharged through the aperture in a spray.

4,114,023
HEATER CONTROL FOR ROTARY MEMBERS

Richard J. Zelinka, Lino Lakes, and George K. Sutherland, White Bear, both of Minn., assignors to Sys-Tec, Inc., New Brighton, Minn.

Filed Oct. 22, 1976, Ser. No. 734,755
Int. Cl.² H05B *1/02*
U.S. Cl. 219—471 **6 Claims**

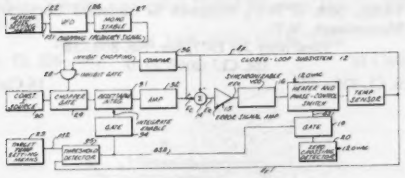


1. Control apparatus for controlling the value of a parameter within a moving enclosure comprising:
(a) a rotatable enclosure having a parameter control element therein;
(b) a current regulating circuit coupled to said parameter control element which is contained in said enclosure and rotatable therewith;
(c) an external, fixedly mounted constant current transmitter for generating a direct current control signal which represents, by means of a constant current, a desired parameter value to be maintained in said enclosure; and
(d) slip-ring means for connecting said direct current control signal to said current regulating circuit.

4,114,024
FEEDBACK-CONTROLLED RADIANT FURNACE FOR FIRING CERAMIC MATERIAL AND THE LIKE

Joseph E. Donner, Pomona, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed Aug. 6, 1975, Ser. No. 602,208
Int. Cl.² H05B *1/02*
U.S. Cl. 219—489 **8 Claims**

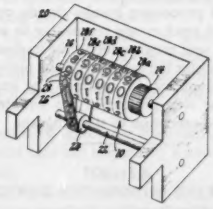


1. In a radiant furnace for firing ceramic material such as artificial teeth and the like, a precision heating system to provide for controlling the temperature of the ceramic material being fired, the heating system comprising:
a source of unregulated line supply voltage;
electrically controllable heating means for radiating heat in the furnace connected to the line supply voltage;
first manually settable means for producing a first programming signal representative of a selected rate at which the temperature of the ceramic material is to be increased during a firing operation;
second manually settable means for producing a second programming signal representative of a selected target temperature beyond which the temperature of the ceramic material is not to be raised;
first circuit means having a first mode of operation for producing a command signal varying in magnitude to define a ramp having a peak magnitude and produce a steady rise in ceramic material temperature and a second mode of operation for producing a substantially stable ceramic material temperature, the first circuit means including means responsive to the first programming signal for controlling the slope of the ramp, means responsive to the second programming signal for controlling the peak magnitude of the ramp and a comparator;
transducer means responsive to the heat radiated from the heating means for producing a feedback signal; said comparator being responsive to the second programming signal and feedback signal for producing a signal to control the mode of operation of the first circuit means;
second circuit means defining a summing junction for algebraically summing the command signal and the feedback signal continuously during system operation to produce an error signal; and
third circuit means responsive to the error signal for continuously controlling the heating means.

4,114,025
MILEAGE INDICATOR

John A. Carol, Jr., and Harold P. McAlindon, both of Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1977, Ser. No. 845,959
Int. Cl.² G01C *22/00*
U.S. Cl. 235—96 **2 Claims**



1. In an odometer for vehicle use having an array of cylindrical coaxial number wheels interconnected to rotate stepwise in digital counting action and in sequence to indicate numerically the cumulative vehicle travel up to a predetermined total, one complete rotation of the highest-order number wheel being indicative of said predetermined total, the improvement comprising:
an idler wheel rotatably mounted so as to have its axis parallel to the axis of the highest-order number wheel a predetermined distance apart therefrom and in a co-planar relationship therewith,
an endless strip of flexible material mounted around the idler wheel and the highest-order number wheel for rotation with the latter, the endless strip having a length equal to an integral multiple of the circumference of the highest-order number wheel, and an array of spaced numerical indicia formed thereon for each rotation of the highest-order number wheel and distinctly marked for each complete revolution of the highest-order number wheel so that the indicia portrays the fact that the particular revolution of the highest-order number wheel is in progress.

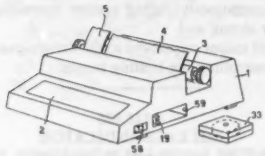
4,114,026
ELECTRONIC DESK-TOP ACCOUNTING MACHINE AND CALCULATOR

Giorgio Fiorenza, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Sep. 13, 1976, Ser. No. 722,506
Claims priority, application Italy, Sep. 15, 1975, 69284 A/75
Int. Cl.² G06K *17/00*; G01R *31/30*
U.S. Cl. 235—375 **17 Claims**

1. A digital accounting machine operable in a programmed

mode or in a manual mode, comprising a keyboard having data keys actuatable for entering data, operative keys actuatable for designating operative commands, and a selector switch settable in a programmed state or in a manual state for selecting the programmed or manual mode of the machine, respectively; a programming unit means for storing a program having a plurality of steps; an electronic data processing unit responsive to the commands designated by said operative keys for executing arithmetic operations in the manual mode and for executing the steps of the program in the programmed mode, respectively; a working memory means for storing data and processing results



arising during execution of the program and the arithmetic operations; a preserving memory; set means, responsive to the manual state of the selector switch to interrupt the execution of the program and transfer the contents of the working memory to the preserving memory, for enabling said working memory to store data and processing results during operation in the manual mode; and reset means responsive to actuation of the selector switch in said programmed state to disable the manual mode and to retransfer the contents of the preserving memory to the working memory, to continue the execution of the program from the step present in the working memory on interruption of the execution of the program.

4,114,027

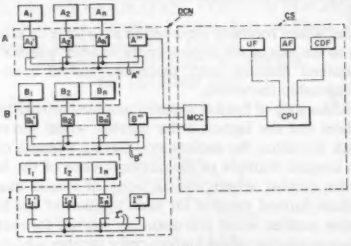
ON-LINE/OFF-LINE AUTOMATED BANKING SYSTEM

Charles E. Slater, Hamilton; Paul E. Dunn, and Lewis B. Mustain, both of Cincinnati, all of Ohio, assignors to The Mosler Safe Company, Hamilton, Ohio

Filed Sep. 13, 1976, Ser. No. 722,741

Int. Cl.[2] **G06K** *5/00;* **G06F** *7/00;* **H04Q** *9/00*

U.S. Cl. 235—419 **57 Claims**



1. In an automated banking system having a central processing unit coupled to a remote unit via a communication link, the improvement comprising:

a card with customer-identifying information encoded thereon, said customer-identifying information being unique to said customer,

a card reader associated with said remote unit and responsive to said customer-identifying information encoded on said card for reading said customer-identifying information,

request message assembly means associated with said remote unit responsive to said customer-identifying information read from said card for preparing and transmitting a request message containing said customer-identifying information to said central processing unit via said communication link,

reply message assembly means associated with said central processing unit and responsive to said request message received from said remote unit for preparing and transmitting to said remote unit a reply message containing account data associated with said identified customer, said account data including (a) account description information designating multiple different accounts of said customer and (b) account balance information for said multiple different accounts of said customer,

transaction selection means associated with said remote unit responsive to said account description information in said reply message for permitting said customer to select a series of different transactions involving said multiple different accounts, including cash withdrawal and/or fund transfer and/or deposits and/or payments,

amount selection means associated with said remote unit for customer-entry of a series of different transaction amounts corresponding, respectively, to transactions of said series of different transactions,

transaction processing means associated with said remote unit responsive to customer actuation of said transaction selection means and said amount selection means for processing independently of said central processing unit said different customer-selected transactions for said different customer-entered amounts in accordance with said account balance information in said reply message so as to determine the allowability of said series of different transactions,

whereby a customer upon a single insertion of his card into said card reader may perform a series of different transactions involving different accounts for different amounts based upon transmission of a single request message to said central processing unit containing said customer-identifying information and receipt of a single reply message from said central processing unit containing said account data, thereby economizing utilization of said communication link and said central processing unit.

4,114,028

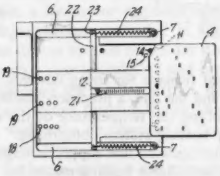
OPTICAL PUNCHED CARD READER

Alfred R. Baio, New Rochelle, and David L. Genovese, Spring Valley, both of N.Y., assignors to Sealectro Corporation, Mamaroneck, N.Y.

Filed May 26, 1977, Ser. No. 800,732

Int. Cl.[2] **G06K** *7/10*

U.S. Cl. 235—458 **16 Claims**



1. An apparatus for reading a punched data card having a plurality of columns and rows comprising an assembly of components including:

a base member for slidably receiving the punched card said base member having first and second opposed faces, said base member further having at one edge thereof a row of spaced data sensing apertures corresponding in number to the number of rows on the data card, said apertures being spaced approximately the same distance as the rows on the data card, said base member further including a centrally located strobe aperture;

a strobe generator for cooperating with the data card for

generating intermittent light signals as the data card is inserted into the reader, said strobe generator being slidably mounted on the first face of said base member, said strobe generator including a column of spaced slots disposed perpendicular to the row of spaced data sensing apertures of said base member, said slots corresponding in number to the number of columns on the data card, said strobe generator slots being spaced approximately the same distance as the spacing between the columns of the data card, said strobe generator being disposed such that the column of slots passes over the strobe aperture of the base member as the data card which is inserted into the reader displaces the strobe generator away from the row of apertures on the base member;

a base member cover plate having substantially the same configuration as said base member, said cover plate being mounted on the first face of said base member over the strobe generator, said cover plate including a row of spaced openings aligned with the row of data apertures sensing of said base member, said cover plate further including a central opening aligned with the central aperture of the base member;

a light source mounted on the second face of said base member within each of the apertures of said base member;

light sensitive sensor mounted within each of the openings of said cover plate;

electrical means for connecting said light sources and light sensors to a read-out device and power source; and

a housing for enclosing said assembly of components, whereby movement of the data card over the row of apertures of the base member along with the simultaneous movement of the strobe generator over the strobe aperture of the base member generates a combination of signals for transmitting the data on the data card to a read-out device.

4,114,029

MAGNETIC RECORDING

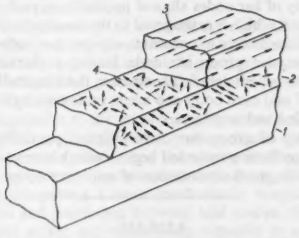
Cyril Arthur Lee, Maidenhead, England, assignor to E M I Limited, Hayes, England

Filed Oct. 15, 1975, Ser. No. 622,753

Claims priority, application United Kingdom, Oct. 16, 1974, 44746/74

Int. Cl.[2] **G06K** *7/08, 19/06;* **G11B** *25/04*

U.S. Cl. 235—449 **11 Claims**



1. A secure magnetic record medium of a body of magnetically anisotropic material having overlaid distinct portions of material, a first portion having a uniform predominant alignment of an easy axis of magnetisation of the material to provide for erasable magnetic recording and a second portion of material of higher coercivity and having a detectable pattern of the variation from point to point of the portion of the permanent predominant alignment of an easy axis of magnetisation of the material to provide by said pattern secure unerasable record, the pattern being latent until made detectable by remanent magnetisation removable to leave the latent pattern, whereby an erasable recording can be made and read without interaction in the read-out signal from the latent secure record pattern.

4,114,030

METHOD AND APPARATUS TO OPTICALLY RECOGNIZE RECORDED INFORMATION

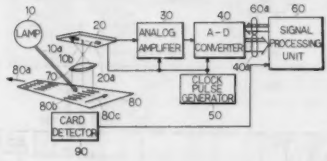
Tadao Nojiri, Kariya; Akio Sugiura, Nagoya, and Masahiro Nomura, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 4, 1977, Ser. No. 756,699

Claims priority, application Japan, Jan. 28, 1976, 51-8163

Int. Cl.[2] **G06K** *7/10, 9/00*

U.S. Cl. 235—464 **8 Claims**



1. A method to optically recognize the information recorded on an object comprising the steps of:

transferring an object on which at least one bar code is recorded, said bar code having parallel bar symbols in different width and light reflecting color;

projecting a light beam onto said object to be reflected thereby;

recieving a reflected light beam from said object by a plurality of optical element aligned to transverse said parallel bar symbols;

sweeping said optical elements one by one in response to clock pulses of a fixed frequency, each of said optical elements generating an image signal, the peak signal level of which corresponds to the density of the reflected light beam;

sampling repetitively the peak signal level of the image signal in timed relationship with the clock pulses;

holding the peak signal level of the image signal sampled in said sampling step to generate an analog signal, the frequency and the signal level of which corresponds to the density of the reflected light beam;

applying the analog signal to a low pass filter having a cut-off frequency lower than one preset in accordance with the widest bar symbol; and

negatively feeding back a low frequency signal passed through said low pass filter onto the image signal, whereby a noise-excluded signal varying only with the width and the color of said bar symbols is generated from said holding step.

4,114,031

DATA CARD READER EMPLOYING SYNCHRONIZATION AND RESYNCHRONIZATION MEANS

Willard T. Bushman, Palm Bay, and Robert C. Snyder, Melbourne, both of Fla., assignors to Documation Incorporated, Palm Bay, Fla.

Filed Aug. 29, 1975, Ser. No. 608,897

Int. Cl.[2] **G06K** *7/016;* **H04L** *15/34;* **G06K** *7/04*

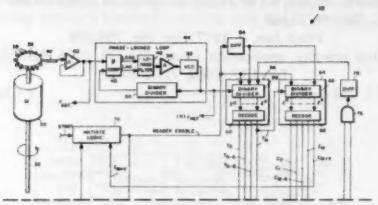
U.S. Cl. 235—474 **23 Claims**

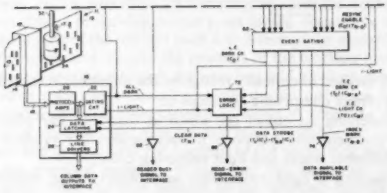
1. Apparatus for reading data cards of the type having columns of machine-readable information thereon, and for providing data outputs representative of said information to a device interfaced therewith, said apparatus including means for synchronizing said data outputs with the respective column of said cards, said synchronizing means comprising:

means including a rotatable shaft for driving said cards through said apparatus;

means for detecting the position of said shaft for each said column;

means for receiving an output from said detecting means and generating a train of pulses, the period of said pulse train being dependent upon the angular velocity of said shaft;





means for processing said pulse train for correlation of each said data output with the corresponding one of said columns, said processing means including first counting means for counting pulses in said pulse train and generating a first output at a predetermined pulse;

means for detecting a leading edge of each said column; and

means for restarting said first counting means responsive to an output from said column leading edge detecting means.

4,114,032

DOCUMENTS HAVING FIBERS WHICH ARE COATED WITH A MAGNETIC OR MAGNETIZABLE MATERIAL EMBEDDED THEREIN AND AN APPARATUS FOR CHECKING THE AUTHENTICITY OF THE DOCUMENTS

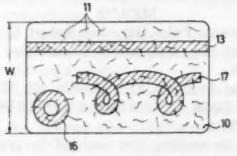
Jörgen Brosow, Elsenwang-Hof, Austria, and Erik Furugard, Geneva, Switzerland, assignors to Dasy Inter S.A., Geneva, Switzerland

Division of Ser. No. 469,625, May 13, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,935

Claims priority, application Fed. Rep. of Germany, May 11, 1973, 2323897; Jun. 6, 1973, 2328880; Apr. 10, 1974, 2417564

Int. Cl.[2] G06K *19/06;* **G06F** *7/02;* **G06K** *7/00*

U.S. Cl. 235—493 **4 Claims**



1. An apparatus for checking the authenticity of documents such as paper money, credit cards, identification cards, and the like, said apparatus comprising in combination:

a document having fibers which are coated with spaced magnetic or magnetizable particles embedded therein;

detecting means for scanning said documents to determine the number of particles present in said documents; and

means for moving said document and said detecting means relative to each other so as to provide a scanning trace, said document and said detecting means being disposed in a close relationship to each other, wherein said detecting means comprises a scanner having a rotational movement and said document is provided with a translational movement so as to obtain a circular scanning trace.

4,114,033

BAR CODE INFORMATION CARD

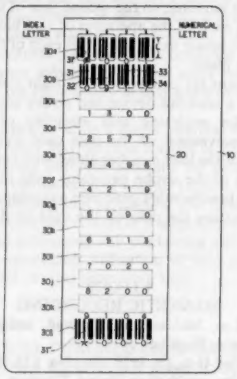
Atutoshi Okamoto, Toyohashi; Tadao Nojiri, and Masahiro Nomura, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 4, 1977, Ser. No. 765,753

Claims priority, application Japan, Feb. 18, 1976, 51-18043[U]

Int. Cl.[2] G06K *19/06*

U.S. Cl. 235—494 **9 Claims**



1. A machine readable bar code information card comprising:

a card body which substantially has a uniform width;

a plurality of bar codes aligned parallelly to each other in a direction which is orthogonal to the longitudinal direction of said card body to constitute a group bar code, each bar code in said group bar code having a plurality of bar symbols which parallelly extend in the longitudinal direction of said card body and are in uniform length in different color and width; and

a plurality of group bar codes aligned parallelly to each other to form a recorded region which extends centrally in the longitudinal direction of said card body.

4,114,034

OPTICAL CURSOR TRACKING CORRECTION SYSTEM

George William Hunka, Bellmawr, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 30, 1977, Ser. No. 782,754

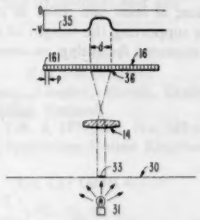
Int. Cl.[2] G05B *1/00*

U.S. Cl. 250—202 **8 Claims**

1. In a digitizing system including movable cursor means for tracing a function to be digitized, means responsive to said movable cursor means for supplying position signals representative of the position of the movable cursor means, and circuit means responsive to said position signals for generating coordinate signals corresponding to the position of said movable cursor means, the improvement comprising:

sensing means mounted in said movable cursor means to

sense the function to be digitized for supplying digital error signals proportional to a difference of position between the function to be digitized and reference point in said movable cursor means; and



processing means responsive to digital error signals and said coordinate signals for producing corrected coordinate signals.

4,114,035

POSITION ENCODER EMPLOYING CHARGE TRANSFER CIRCUIT

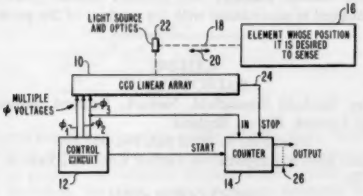
Gerald Bernard Herzog, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1976, Ser. No. 700,120

Claims priority, application United Kingdom, Jan. 30, 1976, 03792/76

Int. Cl.[2] H01J *39/12*; H03K *13/02*

U.S. Cl. 250—211 K **3 Claims**



1. A system for sensing the relative position of an element comprising, in combination:

a linear charge transfer array of the type including a plurality of charge storage locations, each such location responsive to radiation for accumulating and storing charge;

a source of radiation positioned to irradiate any portion not masked of said array;

means responsive to the relative position of said element for physically controlling which portion of said array is irradiated by said radiation and thereby controlling which of said locations will accumulate and store charge, said means comprising a mask mechanically coupled to said element and positioned between said source of radiation and said array, said mask being movable in a direction substantially perpendicular to the long dimension of said array, in a plane between said source and said array, said mask being formed with an edge at an oblique angle to said long dimension and positioned to control the portion of the array receiving radiation from said source in accordance with the mask position; and

means for reading out said array comprising means for shifting out of said array the charge which has become stored in said array in response to said irradiation, the pattern of signals thereby obtained being a digital manifestation of the relative position of said element in the sense that a signal representative of substantial charge may be employed to represent one binary value and a signal representative of less than a given level of charge may be employed to represent the other binary value, and means for sensing the number of signals representing a given binary value in said pattern of signals.

4,114,036

A LEAK CURRENT SUPPRESSING PRINTED CIRCUIT BOARD

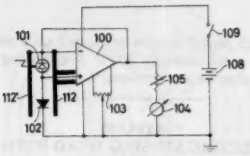
Tokuichi Tsunekawa, Yokohama, and Tetsuya Taguchi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1976, Ser. No. 703,962

Claims priority, application Japan, Jul. 24, 1975, 50-90533

Int. Cl.[2] H01J *39/12*

U.S. Cl. 250—214 R **5 Claims**



1. A leak current suppressing light measuring circuit for a camera comprising:

(a) a printed circuit board;

(b) a high impedance operational amplifier having inverting and non-inverting terminals, off-set voltage adjusting means and an output terminal;

(c) a first signal transfer path printed on said printed circuit board for supplying an electrical signal to one of the input terminals of said operational amplifier;

(d) a second signal transfer path printed on said printed circuit board and connected to the other input terminal of said operational amplifier to form a portion of a feedback circuit for the operational amplifier;

(e) a photoelectric converting element connected between said input terminals of the operational amplifier;

(f) a logarithmic suppression element connected between one end of said second signal transfer path and the output terminal of said operational amplifier; and

(g) guard lines which are arranged on both sides of the second signal transfer path between the point at which the logarithmic suppression element is connected to the second signal transfer path and a point at which the input terminal of the operational amplifier is connected to the second signal transfer path, one end of each guard line being connected to said first signal transfer path to make these guard lines have virtually the same potential as the first signal transfer path.

4,114,037

MULTIPLE LENS SYSTEM FOR AN OPTICAL IMAGING DEVICE

William Dickson Westwood, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed May 16, 1977, Ser. No. 797,509

Int. Cl.[2] H01J *3/14*

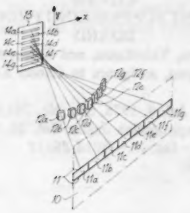
U.S. Cl. 250—216 **9 Claims**

1. A multiple lens system for an optical imaging device for optically dividing a linear object into sections and imaging said sections in a stacked relationship, comprising:

a plurality of lenses extending in a side-by-side arcuate array in a direction corresponding to the longitudinal axis of the linear object, a lens for each section;

a photo-detector imager having a plurality of sections attached one above the other in a direction normal to the longitudinal axis of the linear object, an imager section for each lens;

each lens having its central axis on a line extending between centre points of the related object section and imager section and tilted to position the plane of the lens normal to said line;



whereby each object section is imaged on a related imager section in a substantially 100% overlapping relationship with the other object sections.

4,114,038

PHOTOELECTRIC SENSING HEAD WITH WIPING MEANS

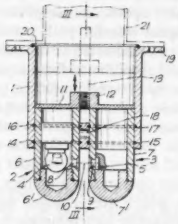
Adrian Roger Parker, St. Austell, England, assignor to Partech (Electronics) Limited, England

Filed Apr. 4, 1977, Ser. No. 784,415

Claims priority, application United Kingdom, Apr. 7, 1976, 14091/76

Int. Cl.² H01J *5/02*

U.S. Cl. 250—239 **17 Claims**



1. A photoelectric sensing head comprising a housing, a source unit and at least one photocell unit arranged side by side in the housing, each said unit having an enclosure with a light transmitting wall, wiping means within the housing which make wiping contact with the light transmitting walls of the enclosures, and means for displacing the enclosures relative to the housing to cause the wiping means to pass over external surfaces of the said light transmitting walls to clean them.

4,114,039

X-RAY APPARATUS

Chuji Tomita, Tokyo, Japan, assignor to Hitachi Medical Corporation, Tokyo, Japan

Filed Nov. 10, 1976, Ser. No. 740,720

Int. Cl.² G01N *21/00, 21/34*

U.S. Cl. 250—439 R **5 Claims**

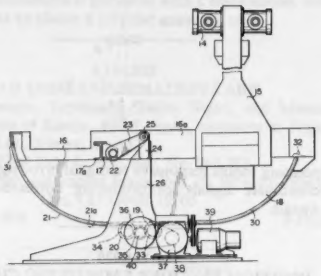
1. An X-ray apparatus comprising;

a base frame;

a roentgenographic pedestal having a patient's table thereon;

an X-ray source and an X-ray television and/or photographic unit in spaced opposed relationship with said patient's table therebetween; and

means for changing the position of said pedestal, said position changing means comprising: a supporting member extending away from the bottom side of said patent's table; a guide rail provided on the periphery of the end of said supporting member, said guide rail having a contact surface with a contour having at least one curved portion protruding in a direction away from the surface of the patient's table and a flat portion joining one end of said curved portion; at least one roller in contact with said guide rail for supporting the weight of said pedestal said roller being mounted for tilting movement transverse to



the axis of rotation thereof; and supporting means for causing the pedestal to move only along the guide rail while in contact with said roller, said supporting means having a shaft extending in a direction transverse to the direction of movement of said pedestal and being rotatably supported on the pedestal, and at least one arm extending from said shaft and pivotably supported on said base frame, whereby the position of the pedestal is changed in accordance with the contour of the guide rail.

4,114,040

RADIOGRAPHY

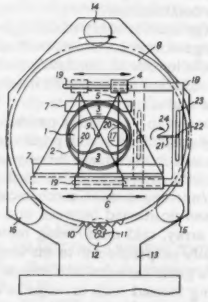
Godfrey Newbold Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

Filed Feb. 5, 1976, Ser. No. 655,396

Claims priority, application United Kingdom, Feb. 8, 1975, 5441/75

Int. Cl.² G03B *41/16*

U.S. Cl. 250—445 T **12 Claims**



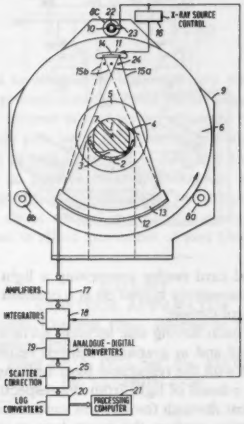
1. Scanning radiographic apparatus including a source of penetrating radiation, such as X-radiation, arranged to project a substantially planar spread of radiation, having a median line, through a body to be examined, a support for said source, means for causing said support to effect a rotational scanning movement about an axis perpendicular to the plane of said spread so that said median line assumes, in the course of said rotational scanning movement, in sequence a number of different angular orientations with respect to the body and in the

plane of said spread of radiation and means for causing said median line, in at least a substantial number of its different orientations and throughout the time the median line assumes those orientations, to remain in a region of said body away from said axis and not to intersect said axis.

4,114,041
RADIOGRAPHY

Colin Charles Oliver, Langley, Slough, England, assignor to EMI Limited, Hayes, England

Filed Feb. 3, 1977, Ser. No. 765,422
Claims priority, application United Kingdom, Feb. 5, 1976, 4546/76
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—445 T **15 Claims**



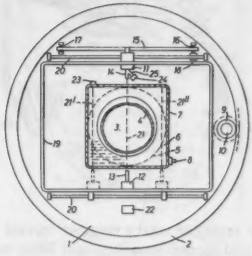
1. Apparatus for examining a slice of a body by means of penetrating radiation, the apparatus including a source arranged to project the radiation through a substantially planar region including the slice, detector means sensitive to the radiation and arranged to receive the radiation after passage through the region, means for causing the source to project the radiation through the region from a plurality of different positions in relation to the body, means for deriving from the detector means output signals each relating to the intensity of radiation transmitted through the region along a respective one of a plurality of beam paths to a respective position in the plane of the region, means for deriving from the same detector means further output signals each relating substantially only to radiation scattered in the region and received by the detector means at a respective one of a plurality of positions in the plane of the region and means for utilising the further output signals to reduce errors, in the first mentioned output signals, caused by radiation scattered within the region.

4,114,042
RADIOGRAPHY

Christopher Archibald Gordon LeMay, Osterley, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 609,718, Sep. 2, 1975, Pat. No. 4,038,551, which is a division of Ser. No. 462,104, Apr. 18, 1974, Pat. No. 3,924,129. This application Mar. 28, 1977, Ser. No. 781,961
Int. Cl.[2] G01N *21/34*
U.S. Cl. 250—445 T **1 Claim**

1. Medical radiographic apparatus including means defining a patient position, a source of penetrating radiation arranged to project said radiation through a patient in said position along at least one beam path, scanning means for scanning said radiation around said patient position to project said radiation through a thin slice of said patient along further beam paths, detector means for detecting the radiation emergent from the patient along said beam paths and for producing data signals indicative of the amount of radiation projected through the patient along said beam paths, and means for processing said data signals to produce a representation of the absorption of said radiation at each of a plurality of small elements of said slice, said processing means including means for assembling said data signals in groups, each relating to a set of beam paths distributed across said region, the different sets of beam paths being characterised by different respective orientations relative to said patient position, and means for modifying each data signal by subtracting therefrom weighted components of the other data signals in the same group as the data signal being



modified; the said other data signals being weighted by multiplication with respective weighting factors, of less than unity, of which at least those appropriate to beam paths separated from the beam path giving rise to the data signal being modified by more than a predetermined number of other beam paths in the same group conform to a substantially monotonic function decreasing in amplitude with increasing separation from said beam path giving rise to the data signal being modified, means being provided for combining the modified data signals to produce said representation; the representation for each element of the slice being the sum of the modified data signals corresponding to the beam paths intersecting the respective element in weights determined by the relative dispositions of the last recited element of the slice and the last recited beam paths.

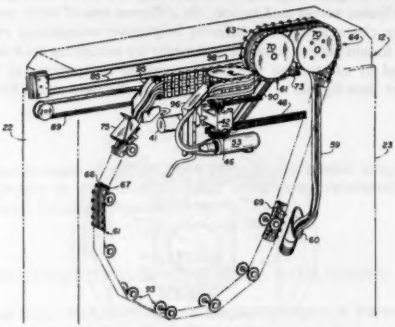
4,114,043
CABLE-SUPPORTING ARRANGEMENT FOR X-RAY TOMOGRAPHIC SCANNER

Myles Stephen Gansfried, Trumbull, Conn., assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 799,089
Int. Cl.[2] A61B *6/02*
U.S. Cl. 250—445 T **14 Claims**

2. An axial tomographic scanner, which comprises a fixed vertically arranged frame; a plate mounted on said frame for rotation about a horizontal axis, means for indexably rotating said plate; a yoke mounted on said plate for back-and-forth translational movement relative to said plate, means to effect back-and-forth translational movement of said yoke; a source mounted on said yoke for directing penetrating radiation through an object to be scanned, a plurality of flexible cables leading to said source; a first chain-cable assembly carrying a fixed length of said cables, first means anchoring the cable-incoming end of said first assembly to said frame, second means anchoring the other end of said first assembly to said plate; a second chain-cable assembly carrying a separate fixed length of said cables, third means anchoring one end of said second assembly to said plate, fourth means anchoring the other, cable-outgoing end of said second assembly to said yoke; a pair of vertically arranged rotary members carried by said frame for engaging said first assembly, one of said rotary members

being rotatably mounted on said frame and the other of said rotary members being rotatably mounted on a first carriage movable horizontally with respect to said frame, said plate-rotating means being adapted to rotate said other rotary member and move its carriage so as to take up the slack that would otherwise be formed in said first assembly upon indexing of said plate; a plurality of linearly spaced small rollers rotatably mounted on said frame for engagement by said first assembly;



a horizontally arranged rotary member carried by said plate for engaging said second assembly, said latter rotary member being rotatably mounted on a second carriage movably parallelly with respect to said yoke, said yoke-translating means being adapted to rotate said latter rotary member and move its carriage so as to take up the slack that would otherwise be formed in said second assembly upon translation of said yoke; and means to effect indexing of said plate and back-and-forth translational movement of said yoke in the desired sequence.

4,114,044

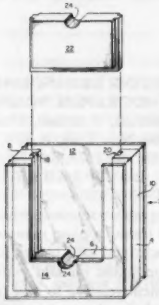
RADIOGRAPHIC CASSETTE ADAPTER

Robert D. Chiulli, 71 Cherry St., Somerville, Mass. 02144

Filed May 9, 1977, Ser. No. 795,093

Int. Cl.² G03B 41/16

U.S. Cl. 250—468 **10 Claims**



1. An adapter assembly for radiographic film cassettes comprising a frame member having a bottom portion and two upright portions extending therefrom, a back portion, and a generally U-shaped front portion, said portions providing an open-ended housing, said frame member having outside dimensions substantially equal to outside dimensions of a first size radiographic film cassette and adapted to be received and retained by holders for said first size radiographic film cassette in radiographic machines, said frame means further having an inside dimension substantially equal to an outside dimension of a smaller size radiographic film cassette and being adapted to slidingly receive and retain said smaller size radiographic film cassette for radiographic operations.

4,114,045

OPTICAL CARD READER FOR SETTING FREQUENCY DIVISION RATIO OF PROGRAMMABLE COUNTER FOR USE IN SYNTHESIZER TUNERS

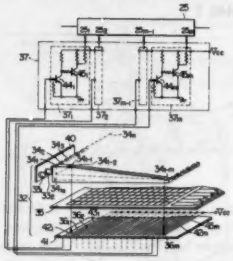
Fumio Shiina, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 27, 1977, Ser. No. 763,083

Claims priority, application Japan, Jan. 30, 1976, 51-8469; Oct. 8, 1976, 51-120347

Int. Cl.² G06K 7/10

U.S. Cl. 250—569 **5 Claims**



1. An optical card reader comprising *n* light emitting elements being successively turned on at a constant scanning rate by a scan control circuit;

n reflectors each having one incident surface formed on a side thereof and *m* gradually-stepped reflection surfaces associated with the respective light emitting elements for receiving a beam of light from the respective light emitting element through the incident surface and dividing by the reflection surface the beam into *m* reflected light fluxes which are substantially parallel with each other;

a card slidably removable with respect to the *n* reflectors and having programmable holes such that ($n \times m$) reflected light fluxes from the reflectors are transmitted through the card or interrupted thereby;

m light receiving elements disposed orthogonally with the reflectors for receiving in common reflected light fluxes which are reflected at the reflection surfaces at the same order of all the reflectors and transmitted through the card; and

m switching circuits operable to produce binary codes by the operation of the respective light receiving elements,

wherein the frequency division ratio of a programmable counter is determined by receiving the binary codes from the switching circuits.

4,114,046

ELECTRICAL GENERATOR EMPLOYING NATURAL ENERGY TO POWER SAME

Hosni Labib Yousef, Willis Ave., Muttontown, N.Y.

Continuation-in-part of Ser. No. 576,168, May 9, 1975, abandoned. This application Feb. 8, 1977, Ser. No. 766,699

Int. Cl.² H02P 9/04

U.S. Cl. 290—55 **13 Claims**

1. Apparatus for generating electrical energy, said apparatus comprising in combination:

a continuous, non-circular, non-axial track including a pair of continuous, substantially parallel rails;

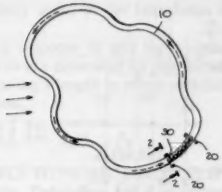
a plurality of electromagnets positioned at fixed locations about said track, said electromagnets having at least two magnetically opposite poles, at least one of said poles being located on each side of said pair of rails;

at least one exciting coil wound about a portion of each of said electromagnets through which is passed a D.C. cur-

rent to create a magnetic flux in each of said electromagnets;

at least one power coil wound about a portion of each of said electromagnets and connected for transmission of the generated electrical energy to external collection means;

a plurality of interconnected ferromagnetic blocks adapted to pass about said non-circular track relative to and at a fixed distance between the opposite poles of said electro-



magnets to alternately maximize and minimize the flux density present in each of said electromagnets to generate an A.C. current in said power coil, said blocks including oppositely positioned rotatable wheels adapted to ride on the rails of said track and at least one turbine blade-like member to receive natural mechanical energy to effect movement of said blocks about said tracks; and

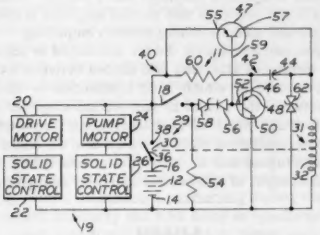
means to focus natural mechanical energy towards said apparatus to effect movement of said blocks.

4,114,047

CONTROL APPARATUS

Grant C. Melocik, Chardon, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Jul. 5, 1977, Ser. No. 813,030
Int. Cl.[2] H02G *3/00*
U.S. Cl. 307—9 **17 Claims**



1. Control apparatus, comprising:

a power supply having an input and an output;

a switch movable between an open position and closed position;

first means for connecting said switch to said power supply output, said first means being changeable between first and second operating conditions, power flowing from the power supply output to the switch at the first operating condition and power flow from the power supply being blocked at the second operating condition, said first means being changeable from the first operating condition to the second operating condition in response to power flow of a preselected magnitude through said first means;

second means for changing said first means from the first operating condition to the second operating condition; and

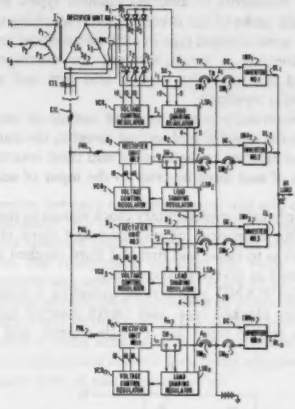
means for automatically, controllably energizing said second means and urging the first means from the first operating condition to the second operating condition only in response to said switch being in the open position.

4,114,048

LOAD BALANCING SYSTEM FOR UPS RECTIFIERS

Robert E. Hull, and Robert S. Gemp, both of Amherst, N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 665,600, Mar. 10, 1976, abandoned.
This application Jul. 18, 1977, Ser. No. 816,556
Int. Cl.[2] H02J *3/38*
U.S. Cl. 307—53 **3 Claims**



1. A system for supplying a load with alternating current from a plurality of adjustable direct current voltage sources with said plurality of voltage sources including a like plurality of rectifier means supplied with alternating current from a power supply common to all voltage sources for generating a corresponding direct current voltage and the system further including a like plurality of inverter means each associated with one of said rectifier means for supplying a corresponding alternating current to said load, comprising:

means associated with one of said voltage sources for sensing direct current supplied therefrom and for deriving a signal representative of said supplied direct current;

means associated with each of said voltage sources for deriving a reference signal representative of the average of the direct currents flowing from all of said sources;

means responsive to said current representative signal and to said reference signal for generating an error signal representative of a discrepancy between said current representative signal and said reference signal; and

means responsive to said error signal for adjusting the direct current voltage of said one source to compensate for said discrepancy.

4,114,049

COUNTER PROVIDED WITH COMPLEMENTARY FIELD EFFECT TRANSISTOR INVERTERS

Yasoji Suzuki, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 333,145, Feb. 16, 1973, abandoned.
This application Oct. 26, 1976, Ser. No. 735,133
Claims priority, application Japan, Feb. 25, 1972, 47-18864
Int. Cl.[2] H03K *23/08, 27/00, 19/08, 19/20*
U.S. Cl. 307—225 C **30 Claims**

1. A diode-less binary counter employing insulated gate field effect transistors each having a source-drain path and a gate, said binary counter comprising:

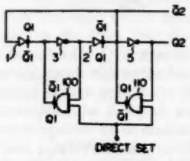
first, second and third inverters, each inverter having an input and an output and a pair of inverting transistors of

different channel types, the gates of said pair of inverting transistors of each inverter being connected to the corresponding input, the source-drain paths of said pair of inverting transistors of each inverter being connected in series between first and second power supply terminals and a circuit point between the series-connected source-drain paths of said inverting transistors being connected to the corresponding output and at least said first and third inverters being clocked inverters which operate as inverters in response to complementary input clock signals, said first and third clocked inverters each including a pair of switching transistors of different channel types, and the source-drain paths of the inverting and switching transistors of the same channel type in each said clocked inverter being connected in series between the corresponding output and the respective one of said first and second power supply terminals;

means for electrically connecting the output of said first inverter to the input of said second inverter, the output of said second inverter to the input of said third inverter and the output of said third inverter to the input of said first inverter;

means for applying complementary clock signals to the gates of switching transistors of said first and third clocked inverters so as to cause said first and third clocked inverters to operate as inverters alternately,

a first clocked NAND gate circuit including a fourth inverter of the clocked type, said fourth inverter having a first and a second input and a single output, said single



output of said fourth inverter being connected to the input of said second inverter and said first input of said fourth inverter being connected to the output of said second inverter, and said fourth inverter of said first clocked NAND gate circuit being simultaneously operable with said third clocked inverter in response to the complementary clock signals;

a fifth inverter having an output and an input, said input of said fifth inverter being connected to the output of said third clocked inverter; and

a second NAND gate circuit including a sixth inverter of the clocked type, said sixth inverter having a first and a second input and a single output, said single output of said sixth inverter being connected to the input of said fith inverter and said first input of said sixth inverter being connected to the output of said fifth inverter, and said sixth inverter of said clocked NAND gate circuit being operable simultaneously with said first clocked inverter in response to the complementary clock signals, the second input of said fourth inverter of said first clocked NAND gate circuit and that of said sixth inverter of said clocked NAND gate circuit being connected to receive a control signal;

said inverters, connecting means, NAND gate circuits and clock pulse applying means each including no diodes,

whereby an input signal and an output signal of each of said first, second and third inverters have a frequency half the frequency of said complementary input clock signals which are applied to the gates of said switching transistors of said clocked inverters.

4,114,050

INTEGRATING CIRCUIT

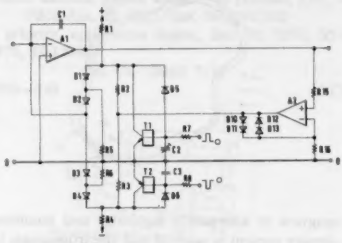
Heinz Lerche, Bremen, Germany, assignor to Varian Mat GmbH, Bremen, Germany

Filed Dec. 30, 1976, Ser. No. 755,881

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1976, 2600194

Int. Cl.[2] H03K *17/00*

U.S. Cl. 307—229 **9 Claims**



1. In an integrating circuit including:

an integrating amplifier having an inverting input for receiving a signal to be integrated, a non-inverting input and an output; and

a feedback capacitor connected between the output and the inverting input of said integrating amplifier; the improvement comprising:

(a) a second amplifier having an inverting input, a non-inverting input and an output;

(b) means connecting the output of said integrating amplifier to one of said inverting and non-inverting inputs of said second amplifier; and

(c) electrically controllable switching means connected to the output of said second amplifier; said switching means having a first condition in which the output of said second amplifier is connected to the inverting input of said integrating amplifier and a second condition in which the output of said second amplifier is connected to ground, said switching means comprising:

(i) two semiconductor diodes connected in series; and

(ii) means for actuating said diodes between a conductive state in which a dc connection is established between the output of said second amplifier and the inverting input of said integrating amplifier and a non-conductive state in which said dc connection is interrupted and a connection is established between the output of said second amplifier and ground.

4,114,051

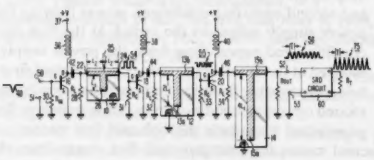
TRIGGERED BURST GENERATOR

Walter Richard Curtice, Princeton Jct., N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,418

Int. Cl.[2] H03K *4/00*

U.S. Cl. 307—260 **22 Claims**



1. A circuit for generating a signal consisting of a train of waveforms having a selected period from an input signal pulse, comprising:

transistor amplifier means including a transistor having input terminals and output terminals,

said transistor having an input impedance and an output impedance exhibited, respectively, across said input and output terminals,

network means including a transmission line and a stub,

impedance means coupling the output terminals of said transistor to said network means,

the characteristic impedance of said transmission line being substantially equal to the impedance of said impedance means,

whereby, in response to said input signal pulse, a train of waveforms are generated by said network,

said stub having a length to effect said desired period of said waveforms.

4,114,052

PRESETTABLE DYNAMIC DELAY FLIP-FLOP CIRCUIT

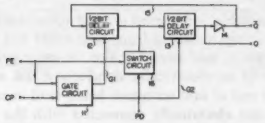
Kenshi Manabe, Yokohama, and Kouichirou Satou, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed May 27, 1977, Ser. No. 801,254

Claims priority, application Japan, May 29, 1976, 51-62769

Int. Cl.[2] H03K *3/286, 3/353, 21/30, 23/30*

U.S. Cl. 307—279 **7 Claims**



1. A presettable dynamic delay flip-flop circuit which comprises gate means for stopping transfer of a clock pulse at least during a data-presetting period and permitting transfer of a clock pulse on other occasions than during the data-presetting period; first delay means remaining intact during the data-presetting period and carrying out ½ bit delay in synchronism with a first output gate signal from the gate means on other occasions than during the data-presetting period; second delay means connected to the output terminal of the first delay means, and served to feedback a delayed out signal from the first delay means, be rendered conducting during the data-presetting period and carry out ½ bit delay in synchronism with a second output gate signal from the gate means on other occasions than during the data-presetting period; and switching means designed to be rendered conducting only during the data-presetting period and supply preset data to the second delay means.

4,114,053

ZERO TEMPERATURE COEFFICIENT REFERENCE CIRCUIT

Robert B. Turner, Weymouth, Mass., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 12, 1977, Ser. No. 758,629

Int. Cl.[2] H01V *3/00;* **G05F** *3/00*

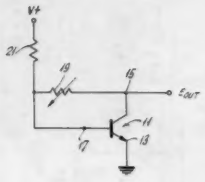
U.S. Cl. 307—310 **3 Claims**

1. A voltage regulation circuit having an input and an output and being temperature stable to provide a nominally zero temperature coefficient, for use in connection with a voltage supply to provide a temperature stable regulated voltage, comprising:

a transistor connected with its emitter to ground and its collector to the circuit output said transistor having individual and different temperature coefficients for its collector-base and base-emitter junctions;

a voltage divider being connected between said voltage supply and said collector of said transistor with its intermediate tap being connected to said base of said transistor, said voltage divider ratio establishing the overall circuit temperature coefficient at nominal zero;

wherein said voltage divider includes a first resistor connected to said voltage supply and a second resistor con-



nected between said first resistor and said collector of said transistor, the interconnection point of said first and second resistors being connected to said base of said transistor, the relationship between the value of said second resistor and said first resistor being to provide an overall circuit temperature coefficient of nominally zero;

wherein said second resistor is a variable resistance, said first resistor being selected at a predetermined nominal value and said second resistor then being adjusted to be substantially 20% of said nominal value.

4,114,054

COUPLING CIRCUIT USING A PHOTOCOUPLER

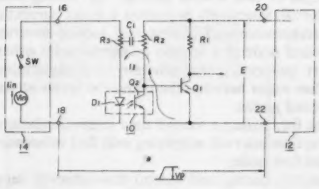
Mamoru Seo, and Akio Uenishi, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1977, Ser. No. 764,177

Claims priority, application Japan, Jan. 30, 1976, 51-9011

Int. Cl.[2] H03K *17/00*

U.S. Cl. 307—311 **9 Claims**



1. A coupling circuit for connecting a first circuit and a second circuit comprising:

a photocoupler including a light emission element whose light emission is controlled by the first circuit and a light receiving element for driving the second circuit by receiving the light from the light emission element to be turned on;

the light emission element and the light receiving element being electrically connected through a stray capacitance arising between the first circuit and the second circuit so that a reverse breakdown of the light receiving element can be produced by a surge voltage applied through the stray capacitance to the light receiving element; and

means connected in parallel to the light receiving element for blocking the reverse breakdown of the light receiving element.

4,114,055

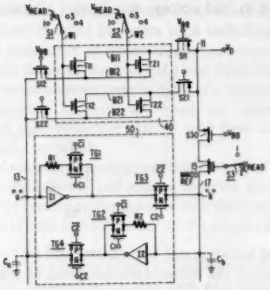
UNBALANCED SENSE CIRCUIT

Richard James Hollingsworth, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 12, 1977, Ser. No. 796,333

Int. Cl.[2] H03K *5/20, 3/286;* G11C *7/00, 11/40*

U.S. Cl. 307—362 **10 Claims**



1. A sense circuit for comparing the voltage produced by a first reference signal current having a first value with the voltage produced by a second signal current having either a first level approximately equal to said first value or a second level substantially different from said first level, comprising:

first and second capacitive nodes;

first and second inverters, each inverter having an input and an output; said first inverter having a different, predetermined, quiescent point than said second inverter for the same value of input bias applied to their respective input terminals;

means connecting the input of said first inverter to said first node, and means connecting the input of said second inverter to said second node;

a first biasing means connected between the input and the output of said first inverter for, during a first time interval, selectively providing a direct current connection therebetween and biasing said first inverter and said first node at a first quiescent point;

a second biasing means connected between the input and the output of said second inverter for, during said first time interval, selectively providing a direct current connection therebetween and biasing said second inverter and said second node at a second quiescent point other than said first quiescent point whereby a predetermined voltage offset exists between the quiescent levels at said first and second nodes;

means for, during a second time interval subsequent to said first time interval, supplying said first reference current to said first node;

means for, during said second time interval, supplying said second signal current to said second node;

the difference in the quiescent points of said first and second inverters being such that the resultant voltage offset between said first and second nodes is: (a) greater in amplitude than, and opposite in direction to, a given voltage difference generated, during said second time interval, between said first and second nodes when said second current is at said first level but exceeds said first current; and (b) substantially smaller in magnitude than the voltage differential generated, during said second time interval, between said first and second nodes when said first current has said first value and said second current has said second value; and

selectively enabled cross-coupled means connected between the output of each one of said first and second inverters and the input of the other one of said first and second inverters for, during a third time interval subsequent to said second time interval, forming a flip-flop set to a first state when said first and second currents supplied to their respective nodes during said second time interval are of approximately equal value and set to its other stable state when said second signal current is at said second level and said first current has said first value.

4,114,056

ROTOR FOR ALTERNATING CURRENT GENERATOR

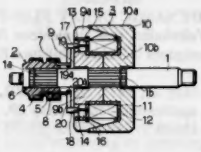
Takayasu Nimura, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 24, 1977, Ser. No. 781,003

Claims priority, application Japan, Mar. 30, 1976, 51-34721; Jan. 14, 1977, 52-3502

Int. Cl.[2] H02K *15/00*

U.S. Cl. 310—42 **5 Claims**



1. A rotor for an alternating current generator comprising:

a rotor shaft;

a slip-ring assembly, supported on said rotor shaft, having a pair of slip rings insulated from each other and held by an insulating body, said assembly also having a pair of terminals made of an electrically conductive flat metal strip, each inner end of said terminals being held in said insulating body and electrically connected with the respective slip rings, and each outer end thereof extending outwardly in the same direction;

a field excitation assembly supported on said rotor shaft concentrically with said slip-ring assembly, said field excitation assembly including:

a pair of rotor segments supported on said rotor shaft, each having a plurality of inwardly and axially extending pole tips at its outer periphery for forming a cavity therein, one of said rotor segments adjacent to said slip-ring assembly being formed with a pair of through holes communicating the outside of the rotor segment with said cavity;

a bobbin, made of an insulating resin, disposed in said cavity for rotation together with said rotor segments, said bobbin having a cylindrical portion and a pair of flanged portions at both ends thereof, said bobbin also having a pair of projections integrally formed with one of said flanged portions and extending outwardly therefrom;

each of said projections being formed with an axially extending groove and a radially and axially extending slit for communicating the outside of the projection with said axially extending groove over the entire axial length;

the flanged portion of said bobbin, on which said pair of projections are integrally formed with, being formed with guiding slits respectively communicating the outside of said flanged portion with said radially and axially extending slits of said projections;

a field excitation coil wound on said bobbin and having coil starting and terminating ends;

a pair of field coil terminals respectively press-fitted into said axially extending grooves of said projections;

said coil starting and terminating ends being respectively inserted into said radially and axially extending slits of said projections and respectively hung to said field coil terminals;

said projections being respectively press-fitted into said through holes of said rotor segment whereby the relative movement of said bobbin with respect to said rotor segments is prevented and each of the field coil terminals and

each of the coil starting and terminating ends is rigidly held in said projections of said bobbin; and

a pair of connecting strips for respectively electrically connecting said field coil terminals held by said projections with said terminals of said slip-ring assembly, the rotor being formed by incorporating the steps of:

press-fitting the field coil terminals into said grooves prior to winding the field excitation coil; and

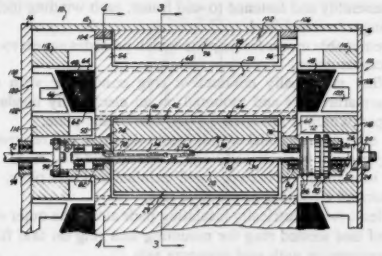
inserting the coil starting and terminating ends into said slits, and hanging said ends to the field coil terminals, prior to disposing the bobbin in said cavity.

4,114,057

DYNAMOELECTRIC MACHINE WITH INNER AND OUTER STATORS

Ernie B. Esters, 15915 Rutherford, Detroit, Mich. 48227

Filed Dec. 6, 1976, Ser. No. 748,091
Int. Cl.² H02K *37/00*
U.S. Cl. 310—46 **15 Claims**



1. In a dynamoelectric machine having an inner stator comprising a plurality of magnets, an outer stator comprising a plurality of magnets, a pair of end stators comprising a plurality of magnets and a rotor mounted for rotation between said stators, said rotor comprising a first plurality of flat longitudinally elongated substantially rectangular radially disposed thin magnetic cores having electrical windings wound longitudinally therearound and a second plurality of flat longitudinally elongated substantially rectangular radially oriented thin magnetic cores disposed each between consecutive wound magnetic cores, the improvement comprising each of said magnetic cores having at least at an end thereof a first extension integral with said rectangular plate projecting radially toward said outer stator and a plurality of magnets in said outer stator disposed such as to form a radially magnetic gap with said first core extension.

4,114,058

SEAL ARRANGEMENT FOR A DISCHARGE CHAMBER FOR WATER COOLED TURBINE GENERATOR ROTOR

Jacques E. Albaric, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 3, 1976, Ser. No. 720,331
Int. Cl.² H02K *9/00*
U.S. Cl. 310—54 **8 Claims**

1. A rotor for a dynamoelectric machine comprising:

a body portion having windings thereon, said windings having openings for the circulation of a coolant liquid therethrough,

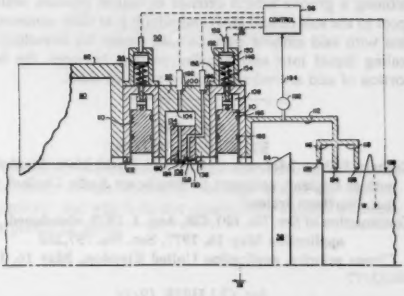
a shaft extending from said body portion, said shaft having passages for circulation of said liquid coolant therethrough and a discharge chamber disposed thereon, said passages in said shaft including a discharge passage for discharging said liquid coolant from said shaft and into said discharge chamber, and,

a contact seal device

means for applying said contact seal device to said shaft sealing said discharge chamber when said rotor is operating in a first predetermined speed range,

means for removing said contact seal device from said shaft when said rotor is operating in a second predetermined speed range,

a gland seal device for sealing said discharge chamber when said rotor is operating in said second predetermined speed range,



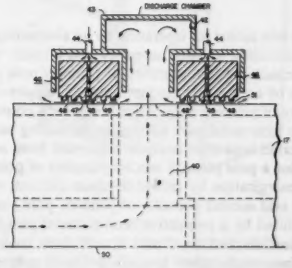
control means for activating said means for applying said contact seal device to said shaft when said rotor is operating in said first predetermined speed range and activating said means for removing said contact seal device from said shaft when said rotor is operating in said second predetermined speed range.

4,114,059

GROOVED VISCO SEAL FOR STATIONARY DISCHARGE CHAMBER OF WATER-COOLED TURBINE GENERATOR

Jacques E. Albaric; Little P. Curtis, both of Monroeville, and George F. Dailey, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 3, 1976, Ser. No. 720,332
Int. Cl.² H02K *9/00*
U.S. Cl. 310—54 **2 Claims**



1. In a dynamoelectric machine of the type including a rotor and a shaft extending from said rotor, said shaft having a passage for circulation of a liquid cooling fluid therethrough, said passage in said shaft including a discharge passage for discharging said liquid coolant from said shaft and into said discharge chamber, and further including sealing means for sealing said discharge chamber, said sealing means including a first seal device for sealing said discharge chamber during rotation of said shaft in a first speed range corresponding generally from standstill through a first predetermined speed of rotation of said shaft, said first seal device being a contact seal, and a second seal device for sealing said discharge chamber during rotation of said shaft in a second speed range corresponding generally to a speed substantially equal to said first predeter-

mined speed of rotation through a second predetermined speed of rotation greater than said first predetermined speed of rotation, said second seal device comprising a gland seal having an annular body portion disposed about said shaft, said annular body portion being spaced apart from said shaft to define an annular passage, the surface of said annular body portion confronting said shaft having a land portion extending in helical relation with respect to the axis of said shaft, said land portion defining a groove which extends in helical relation with respect to the axis of said shaft and which is in fluid communication with said annular passage, and means for introducing a sealing liquid into said annular passage between the body portion of said second seal device and said shaft.

4,114,060

ELECTRIC MOTOR

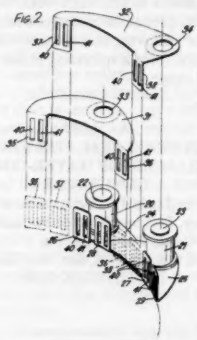
Graham Wilson McLean, Lymm, and David Holt, Stapleford, both of England, assignors to Strathearn Audio Limited, Belfast, Northern Ireland

Continuation of Ser. No. 601,438, Aug. 1, 1975, abandoned. This application May 16, 1977, Ser. No. 797,252

Claims priority, application United Kingdom, May 16, 1977, 34153/77

Int. Cl.² H02K *19/14*

U.S. Cl. 310—163 **6 Claims**



1. An electric motor for operation by an alternating current, the motor including a stator assembly and a rotor, the stator assembly including a first plurality of primary pole pieces for energisation by an in-phase current, respective pairs of the said first plurality of primary pole pieces being each constituted by a respective first metal part having an extending surface and first and second bent over portions separated from each other to each define a pole piece, a second plurality of primary pole pieces for energisation by an out-of-phase current, respective pairs of the said second plurality of primary pole pieces being each constituted by a respective second metal part having an extending surface and third and fourth bent over portions separated from each other to each define a pole piece, the separated pole pieces of the pairs of the first plurality being arranged alternately with the separated pole pieces of the pairs of the second plurality, each bent over portion defining slots extending parallel to the axis of rotation of the rotor and constituting a plurality of secondary pole pieces associated with each primary pole piece and the rotor having a plurality of further pole pieces, the pitch of the further pole pieces corresponding to the pitch of the secondary pole pieces and the arrangement of the secondary and further pole pieces being such that when the secondary pole pieces associated with the first plurality of pole pieces are opposite to respective ones of the further pole pieces the secondary pole pieces associated with the second plurality of pole pieces are displaced with respect to respective ones of the further pole pieces according to the phase angle between the in-phase and out-of-phase currents.

4,114,061

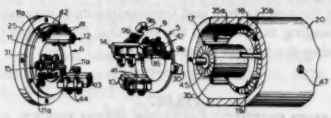
BRUSH CAGE FOR A DYNAMOELECTRIC MACHINE

Clyde M. Hayes, Lamertville, Mich., assignor to Eltra Corporation, Toledo, Ohio

Filed Mar. 7, 1977, Ser. No. 775,084

Int. Cl.² H02K *13/00*

U.S. Cl. 310—241 **5 Claims**



1. An electric motor, comprising:

a motor frame,

an armature assembly which is rotationally mounted along its axis within said frame and includes a commutator,

at least three stator windings disposed around said armature assembly and fastened to said frame, each winding including a terminal lead,

a removable motor frame plate which provides access to said commutator,

a first electrically conductive ring concentric with said armature axis and mounted on an electrically insulating pad which is mounted on said removable plate,

an electrical terminal which passes through said removable plate and is electrically connected to said first ring,

an insulating pad between said terminal and said plate,

a second electrical conductive ring,

at least two electrically insulating pads along the outer edge of said second ring for mounting said ring on said frame concentric with said armature axis,

a first set of at least three brush boxes mounted on, and in electrical contact with said first conductive ring, whereby said first set of three brush boxes are electrically interconnected, and

a second set of three brush boxes mounted on, and in electrical contact with said second conductive ring, whereby said second set of three brush boxes are electrically interconnected.

4,114,062

THICKNESS SHEAR RESONATOR FOR USE AS AN OVER-TONE QUARTZ CRYSTAL

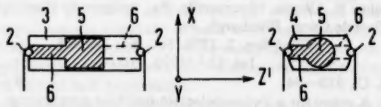
Werner Mattuschka, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sep. 2, 1977, Ser. No. 830,046

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641571

Int. Cl.² H01L *41/10*

U.S. Cl. 310—326 **6 Claims**



1. A thickness shear resonator used as an overtone quartz crystal for a quartz stabilized oscillator with an operating frequency in the MHz range that has an excitation electrode on each of its plane-parallel surfaces running in plane x, z' and in which the thickness of the vibrator in direction y' is determined by the distance of the plane-parallel surfaces from each other characterized in that the vibrator (1, 3, 4) presents a dimensional ratio between its dimension measured in the z' direction and its thickness having a value which lies in the range between $20/\sqrt{\beta}$ and $30/\sqrt{\beta}$ with a value for the thickness of the

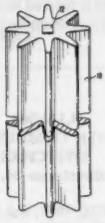
vibrator (1, 3, 4) determined by a fundamental quartz crystal frequency which has a value of $\frac{1}{3}$ of the operating frequency, and a dimensional ratio of about $12/\sqrt{\beta}$ with a value for the thickness of the vibrator determined by a fundamental quartz crystal frequency which has a value of 1/5 of the operating frequency, β being the ratio of the vibrator dimension in the x direction to that in the z' direction and having a value in the range of 0.3 to 1.0.

4,114,063

PIEZOELECTRIC SEDIMENT PARTICLE TRANSPORT DETECTOR

Arthur Nelkin, Annapolis; Dale D. Skinner, Severna Park; Donald G. Wilson, Severna Park, and Harold D. Palmer, Severna Park, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1977, Ser. No. 791,434
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—334 **8 Claims**



1. A sediment particle movement detector system comprising:

a. an elongated probe member of a material which will support acoustic propagation, for positioning in the path of expected sediment transport;

b. transducer means coupled to said probe member and operable to provide an output signal in response to impingement of said particles upon said probe member, each said impingement causing an acoustic emission; and

c. circuit means connected to receive said output signal of said transducer means for providing an indication of said impingement, said indication being indicative of said sediment transport past said probe member;

d. the major length of said elongated probe member, which is exposed to said sediment transport having an irregularly shaped surface to break up laminar flow around said probe;

e. said irregularly shaped surface being so shaped as to increase the impingement of said sediment particles on said probe member.

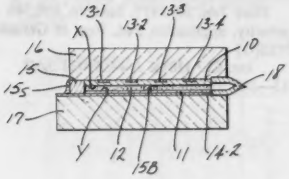
4,114,064

MULTIPLE GASEOUS DISCHARGE DISPLAY/MEMORY PANEL HAVING IMPROVED VOLTAGE CHARACTERISTICS

Roger E. Ernsthausen, Luckey, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 60,376, Aug. 3, 1970, abandoned. This application Oct. 2, 1972, Ser. No. 293,817
Int. Cl.[2] H01J *61/30, 61/35*
U.S. Cl. 313—188 **3 Claims**

1. In a gaseous discharge display/memory device comprising an ionizable gaseous medium in a gas chamber formed by a pair of opposed dielectric material members backed by electrode members, the electrode members behind each dielectric material surface being transversely oriented with respect to the electrode members behind the opposing dielectric material surface so as to define a plurality of discharge units, said dielectric material surfaces serving to store charges during each half-cycle of operation, the improvement wherein each dielectric member is selectively enriched with at least one element selected from the group consisting of lithium, sodium, potassium, rubidium, cesium, francium, beryllium, magnesium, calcium, strontium and barium in an amount sufficient to provide gas discharge device operating voltages which are substantially uniform and which do not significantly change with time after a period of aging.

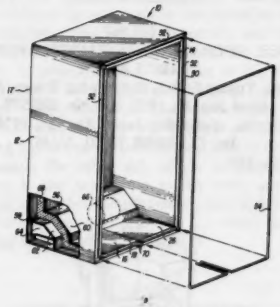


4,114,065

REFRIGERATOR CABINET AND METHOD OF CONSTRUCTING

Julius B. Horvay, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 9, 1976, Ser. No. 749,164
Int. Cl.[2] B65D *25/18;* F25D *11/00*
U.S. Cl. 312—214 **10 Claims**



3. A refrigerator cabinet comprising:

a single sheet of metal including a plurality of first portions for forming the top, side and bottom outer walls of the cabinet;

said sheet further including a plurality of second portions for forming the top, side and bottom inner walls of the cabinet, said inner walls forming a food compartment;

said sheet further including a section disposed between said first portions and said second portions and having a plurality of perforations therein for retarding heat transfer between said first portions and said second portions;

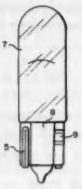
said sheet being bent to cause said first portions and said second portions to form said top, side and bottom outer and inner walls and said section to form a surface framing the door opening of the cabinet; and

means disposed in assembled relation with said section for supplying heat thereto to reduce sweating of the outer wall of the cabinet.

4,114,066
SUBMINIATURE INCANDESCENT LAMP

Hans Wiedenmann, Heidenheim, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen m.b.H., Munich, Fed. Rep. of Germany

Filed Jun. 10, 1977, Ser. No. 805,368
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 7619712[U]
Int. Cl.² H01K 1/44; H01J 5/48
U.S. Cl. 313—315 1 Claim



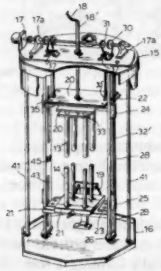
1. In combination with a subminiature lamp comprising a tubular bulb, a pair of lead-in wires spaced within said bulb by a glass bead in which said lead-in wires are sealed, and a filament supported within said bulb by said lead-in wires, a flattened press portion of said bulb effecting closure of same, and said lead-in wires sealed through said flattened press portion of said bulb, the improvement which comprises:

outer sections of said lead-in wires extending exteriorly of said bulb, re-entrant sections of each of said outer lead-in wire sections being supported in said flattened press portion to form two U-shaped loops the sides of each of which touch throughout their length, and said U-shaped loops each bent back about the lower end of said flattened press portion with said loops closely abutting opposite sides of said flattened press portion.

4,114,067
ELECTRODE OPERATING MECHANISM FOR CARBON ARC LAMP

Shigeru Suga, Yoyogi 5-20-2, Shibuya-ku, Tokyo, Japan

Filed Jun. 10, 1977, Ser. No. 805,577
Claims priority, application Japan, Dec. 14, 1976, 51-168058
Int. Cl.² H05B 31/20, 31/48
U.S. Cl. 314—134 3 Claims

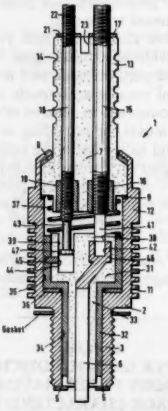


1. An improved electrode operating mechanism for control of the discharge of carbon arc lamps for light fastness testing devices, comprising an upper electrode holder means and a lower electrode holder means vertically spaced from each other, a plurality of electrodes on each holder means projecting toward each other with the ends of corresponding electrodes opposed to each other, an upper base and a lower base vertically spaced from each other with said holder means being between said bases, two vertical support means extending between said upper and lower bases, said vertical support means each having a pair of spaced parallel guide rails extending therealong, each holder means having laterally projecting arm members extending from the opposite ends thereof and between said rails, a cylindrical slide member mounted on the end of each arm member and slidably engaged in linear sliding contact with the surface of said parallel rails on the sides thereof away from the holder means, a first wire attached to the cylindrical slide member at each end of said lower electrode holder means and extending upwardly through said upper base, said cylindrical slide members on said arms on said upper base having axial bores therethrough through which said first wires freely pass, two second wires attached to said upper holder means and extending upwardly through said upper base, a horizontal shaft rotatably mounted on said upper base and having a pulley thereon for each of said wires, the first wires being wound in one direction around two of the pulleys and the second wires being wound in the opposite direction around the other pulleys, whereby when the shaft is rotated in one direction the electrodes are moved toward each other and when the shaft is rotated in the opposite direction the electrodes are moved away from each other.

4,114,068
SPARK PLUG WITH COMBUSTION PRESSURE SWITCHES

Etier-Peter Tylka, Schillerstrasse 34, D-4402 Graven-Reckenfeld, Germany

Filed May 26, 1977, Ser. No. 800,950
Claims priority, application Fed. Rep. of Germany, May 29, 1976, 2624238
Int. Cl.² H01T 13/40
U.S. Cl. 315—51 17 Claims

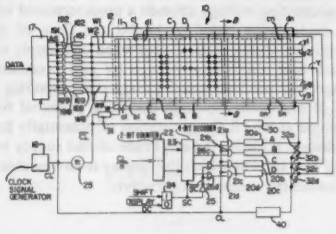


1. A spark plug for an internal combustion engine having a battery or magneto ignition system including an ignition coil, said spark plug comprising a casing or body, a center electrode and a connector pin for said center electrode, characterized by a plunger (31) adapted to be axially displaced interiorly of said spark plug (1) by the compression pressure; a first pair of contacts (41, 42; 41, 76) disposed between said connector pin (15) and said center electrode (6), which contracts are closed by movement of said plunger; a terminal (22, 84) for connection to the primary winding (54) of said ignition coil (52); and a second pair of contacts (44, 47; 79, 82, 4) arranged between ground (potential) and said terminal, which contacts are closed and opened by movement of said plunger.

4,114,069
METHOD AND APPARATUS FOR DRIVING A GAS-DISCHARGE DISPLAY PANEL

Hisashi Yamaguchi, Kakogawa; Seii Sato, Kobe; Toshiaki Iemori, Kakogawa, and Shizuo Andoh, Kobe, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 594,547, Jul. 9, 1975, abandoned. This application Feb. 11, 1977, Ser. No. 767,690
Int. Cl.[2] H05B *41/14;* G06F *3/14*
U.S. Cl. 315—169 TV 6 Claims



1. A method of driving a gas discharge display panel having a first base plate with a set of parallel common electrodes disposed thereon, a second base plate with a set of parallel shift electrodes disposed thereon, said set of parallel common electrodes being oriented to respectively traverse the set of parallel shift electrodes in intersecting fashion for defining a discharge region at each of the traversing intersections, a set of write electrodes disposed on said first and second base plates, said set of write electrodes corresponding to said set of parallel common electrodes and defining write discharge regions, and a discharge gas contained between said plates occupying said discharge regions, comprising the steps of:

(a) addressing selected ones of said set of write electrodes with a write voltage producing discharges at corresponding selected write discharge regions;

(b) applying a first shifting voltage pulse to a first shift electrode of said set of parallel shift electrodes immediately adjacent said selected write discharge regions thereby effecting a lateral shifting of said selected discharges by causing adjacently corresponding intersecting regions of said first shift electrodes to discharge;

(c) applying second and subsequent sequentially shifting voltage pulses to second and subsequent shift electrodes of said set of parallel shift electrodes immediately adjacent said second and subsequent electrodes respectively, to thereby effect lateral shifting of said selected discharges;

(d) halting lateral shifting of said selected discharges when said discharges are at a desired display location;

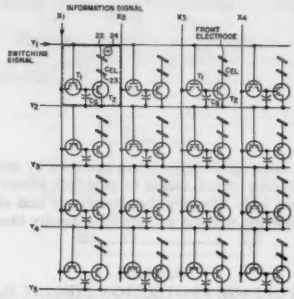
(e) applying display voltage pulses at a predetermined rate to at least two adjacent electrodes in alternate fashion at said desired display location, to thereby effect limited shifting of said selected discharges in oscillating fashion between said at least two adjacent electrodes and causing said shifted selected discharges at said desired location to be displayed at said at least two adjacent electrodes; and

(f) sequentially applying erase pulses for erasing a wall charge generated by said selected discharges following said shifting and display voltage pulses being applied and said selected discharge being shifted to an adjacent electrode.

4,114,070
DISPLAY PANEL WITH SIMPLIFIED THIN FILM INTERCONNECT SYSTEM

Juris A. Asars, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 22, 1977, Ser. No. 780,138
Int. Cl.[2] H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169 TV 5 Claims



1. A display panel comprising an array of rows and columns of interconnected unit display cells which each comprise:

an electro-optic display medium disposed between two spaced apart electrodes, one electrode of which is light transmissive and common to all the display cells of the panel, with the other electrode being connected to thin film control circuitry consisting of, an information signal addressing transistor the gate of which is connected to a switching signal bus which is connected to a row of display cells, and the source of the information signal transistor is connected to an information signal bus which is connected to a column of display cells, with the drain of the information signal transistor connected to one side of an information signal storage capacitor, and also to the gate of a power transistor, the conductance of the power transistor is controlled as a function of the information signal applied to the power transistor gate, with the power transistor source and drain contacts connected between said other electrode for the display medium and the switching signal bus for the adjacent row of display cells, and wherein the other side of the information storage capacitor is also connected to the same adjacent row switching signal bus, which bus is connectable as a common reference and power return bus when the adjacent switching signal bus is being so used.

4,114,071
LIGHT MODULATOR SYSTEM

Herbert T. Thrower, Jr., 2612 C Park Rd., Charlotte, N.C. 28209, and Donald S. Wasness, Spartanburg, S.C., assignors to Herbert T. Thrower, Jr., Charlotte, N.C.

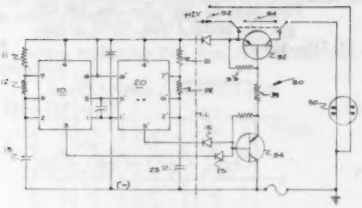
Filed Oct. 18, 1976, Ser. No. 733,321
Int. Cl.[2] H05B *37/02;* B60Q *1/02*
U.S. Cl. 315—226 14 Claims

1. A light intensity modulator system for at least one incandescent lamp comprising:

(a) first timer switch means electrically connectable to a source of power;

(b) second timer switch means connected in parallel with said first timer switch means and being operated at a faster switch cycle than said first timer switch means, said second timer switch means overriding said first timer switch means when said first timer switch means is in an off mode and operating at a switch cycle sufficiently fast to preclude complete loss of illumination of an incandescent lamp associated therewith; and

(c) power interrupter means electrically connected to said source of power, at least one incandescent lamp and the output of said first and second timer switch means, said



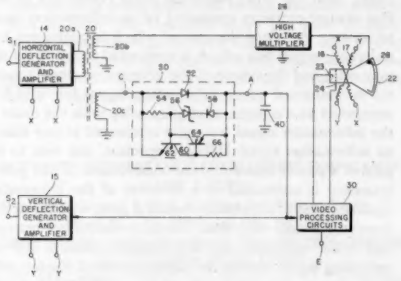
power interrupter means being operated by said first and second timer switch means to modulate power to said at least one lamp whereby the intensity of said at least one lamp changes without a complete intensity loss.

4,114,072

HIGH VOLTAGE PROTECTION CIRCUIT HAVING PREDICTABLE FIRING POINT

Donald Henry Willis, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 26, 1977, Ser. No. 819,187
Int. Cl.² H01J *29/70*
U.S. Cl. 315—411 **6 Claims**


HIGH VOLTAGE MULTIPLIER
HORIZONTAL DEFLECTION GENERATOR AND AMPLIFIER
VERTICAL DEFLECTION GENERATOR AND AMPLIFIER
VIDEO PROCESSING CIRCUITS

1. In a television receiver including a kinescope for generating at least one electron beam, deflection means for generating horizontal and vertical deflection signals for controlling the deflection of said electron beam, high voltage means for generating a relatively high operating potential in response to said horizontal deflection signals, and video processing means for controlling the modulation of said electron beam to provide a display, apparatus comprising:

a transformer winding coupled to said deflection means for developing an alternating voltage in response to said horizontal deflecton signal;

supply voltage means including at least a filter capacitor for developing a supply voltage for said deflection means and said video processing means; and

an integrated circuit device having a first terminal coupled to said transformer winding and a second terminal coupled to said filter capacitor, said integrated circuit device including rectifying means coupled between said first terminal and said second terminal for charging said filter capacitor in response to said alternating voltage so that said supply voltage has a sufficient amplitude for a viewable display;

switching means exhibiting the conduction characteristics of a silicon controlled rectifier coupled between said first terminal and said second terminal, said switching means including a control electrode for controlling the conduction thereof, said switching means being normally nonconductive; and

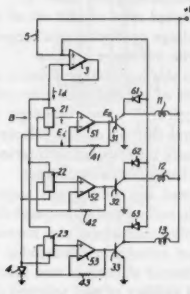
voltage reference means including a Zener diode and a diode coupled in series relationship between said first terminal and said second terminal, said Zener diode and said diode also being directly connected in series between said second terminal and said control electrode of said switching means, said voltage reference means being normally nonconductive, said voltage reference means being rendered conductive and thereby coupling a conduction control current to said switching means to render it conductive in turn when the difference between said supply voltage and said alternating voltage exceeds a predetermined voltage, said diode being poled to inhibit the flow of current through said Zener diode except when said supply voltage exceeds said alternating voltage by said predetermined voltage, said predetermined voltage corresponding to the level of said relatively high operating potential for said kinescope at which the generation of potentially harmful X-radiation is likely, the amplitude of said supply voltage falling to a level at which the display is unviewable when said switching means is conductive.

4,114,073

BRUSHLESS MOTOR DRIVING CIRCUIT

Mitsuo Uzuka, Urawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 810,982
Claims priority, application Japan, Nov. 19, 1976, 51-139903
Int. Cl.² H02K *29/00*
U.S. Cl. 318—138 **16 Claims**

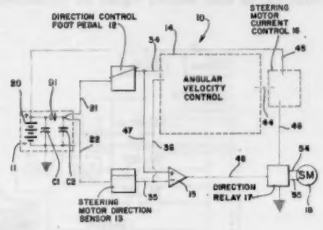


1. A driving circuit for a brushless motor of the type having a permanent magnet rotor and plural phase stator windings, said driving circuit comprising position detecting means for detecting the rotary position of said rotor; means for supplying driving currents in sequence to the plural phases of said stator windings in accordance with the position of said rotor detected by said detecting means, a portion of the driving currents flowing through at least two of said phases being overlapped when said motor is started up; and means for reducing the duration of each driving current as the motor approaches a normal speed so as to correspondingly reduce the overlapped portions of said driving currents flowing through said phases.

4,114,074
DEVICE FOR ELECTRONIC DIRECTION CONTROL OF TROLLING MOTORS

Alan Stewart, Fayetteville, and Richard Lee Majefski, Combs, both of Ark., assignors to Shakespeare of Arkansas, Inc., Fayetteville, Ark.

Filed Nov. 23, 1976, Ser. No. 744,337
Int. Cl.[2] H02P 7/28
U.S. Cl. 318—257 **12 Claims**

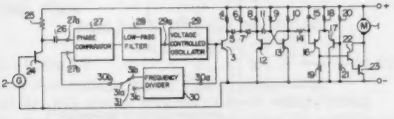


1. A device for electronic direction control of trolling motors for maneuvering boats comprising:
- means for altering the direction of the trolling motor thrust,
- means for generating a first signal proportional to the desired direction of trolling motor thrust,
- means for generating a second signal proportional to the actual direction of trolling motor thrust.
- means for supplying power to said means for generating a first signal and means for generating a second signal, and
- electronic processing means receiving said first signal and said second signal and providing an output signal for continuously, variably controlling the angular velocity of said means for altering the direction of the trolling motor thrust.

4,114,075
ROTATION CONTROL SYSTEM

Hiroshi Minakuchi, Shiga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 25, 1977, Ser. No. 818,842
Claims priority, application Japan, Jul. 26, 1976, 51-89440; Apr. 20, 1977, 52-46259
Int. Cl.[2] H02P 5/16
U.S. Cl. 318—341 **5 Claims**

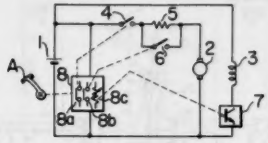


1. A rotation speed control system for a rotary machine comprising:
- a rotation speed detector coupled to the rotary machine for generating a signal having a repetition frequency dependent on the rotation speed of the rotary machine;
- a phase comparator having two input terminals, one of which is applied with the output signal of said rotation speed detector;
- a voltage controlled oscillator having a control input terminal applied with the output signal of said phase comparator;
- a frequency divider applied with the output signal of said voltage controlled oscillator and supplying the output signal to the other input terminal of said phase comparator; and
- a rotation speed controlling circuit for said rotary machine, having a detection signal input terminal applied with the output signal of said voltage controlled oscillator.

4,114,076
CONTROL SYSTEM FOR A MOTOR HAVING A SHUNT FIELD WINDING

Takanori Teranishi, Aichi, and Toshihiko Nakashima, Chiryu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 18, 1977, Ser. No. 788,429
Int. Cl.[2] H02P 1/20
U.S. Cl. 318—421 **10 Claims**

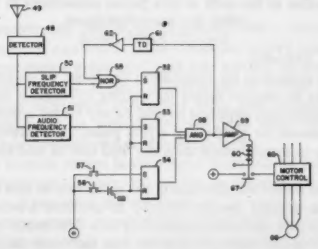


1. A control system for a motor having a shunt field winding, comprising:
- power supply circuit means including a power supply for powering said motor;
- motor control means for generating a control amount;
- means for generating a command signal to command the amount of increase or decrease of a rotational speed of said motor in accordance with the control amount of said motor control means;
- means connected to said means for generating the command signal for controlling a field current; and
- said means for generating the command signal including control signal generating means for increasing said field current independently of said power supply voltage in accordance with the control amount when positive acceleration control is effected within a predetermined control range.

4,114,077
ROTOR OVERTEMPERATURE PROTECTION FOR ELECTRIC MOTORS

Robert M. Oates, Murrysville, and Raymond W. Mackenzie, Baldwin Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 1, 1977, Ser. No. 783,525
Int. Cl.[2] H02P 1/04
U.S. Cl. 318—473 **9 Claims**



1. In combination with an electric motor having a rotor member carrying a squirrel-cage winding, temperature sensing means on said rotor responsive to the temperature of said winding, a transmitter on the rotor controlled by said temperature sensing means to transmit a signal of predetermined characteristics when said temperature exceeds a predetermined value, transformer means on the rotor associated with the rotor

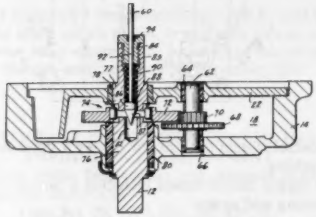
winding for supplying power to said transmitter from current flowing in the winding, and a stationary receiver adapted to receive signals from said transmitter and including means for effecting deenergization of the motor in response to a signal of said predetermined characteristics.

4,114,078

MECHANICAL TORQUE LIMIT FOR VALVE ACTUATOR

Richard F. Malinski, 200 Beech Dr., Schaumburg, Ill. 60172, and Aubrey C. Childers, 2070 Coral Ave., Aurora, Ill. 60506

Filed Jan. 24, 1977, Ser. No. 761,596
Int. Cl.[2] H02H *7/08;* H02P *3/00*
U.S. Cl. 318—475 **11 Claims**



1. A valve actuator comprising:
an output shaft for connection to a valve to be operated;
a drive motor for connection to an energy supply and which is selectively energizable to operate in alternate directions;
switch means connected in series with said drive motor and the energy supply; and
coupling means coupling said drive motor to said output shaft, including torque responsive means extending coaxially and radially through said output shaft for operating said switch means to open the connection between said drive motor and the energy supply upon the occurrence of a predetermined resistance to shaft rotation at said output shaft.

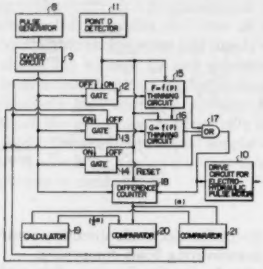
4,114,079

ROTARY CUTTER DRIVE CONTROL WITH ELECTRIC MOTOR

Hiroshi Miyakita, Toyonaka, Japan, assignor to Ichiro Miyakita, Japan

Continuation-in-part of Ser. No. 459,620, Apr. 10, 1974, Pat. No. 4,015,183. This application Dec. 7, 1976, Ser. No. 748,318
Claims priority, application Japan, Oct. 4, 1973, 48-111679; Sep. 13, 1976, 51-110513
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.[2] G05B *19/28*
U.S. Cl. 318—601 **7 Claims**

1. An apparatus for controlling the speed of a rotary cutter driven by an electric motor for cutting to length a sheet material continuously supplied to said rotary cutter comprising:
first means for producing a first pulse train having a pulse rate in synchronism with the feed rate of said sheet material,
second means for decreasing the pulse rate of said first pulse train applied thereto thereby to produce a second pulse train and operative selectively in a first mode where the rate of decrease of the pulse rate increases progressively according to a predetermined first pattern and in a second mode where the rate of decrease of the pulse rate decreases progressively according to a predetermined second pattern,
detecting means for producing a first signal when the blades of said rotary cutter reach a predetermined position after cutting,
comparator means for producing second and third signals when the difference between the number of pulses of said first pulse train applied to said second means and that of said second pulse train produced by said second means reaches a predetermined first value and a predetermined second value, respectively,
first gate means for causing said second means to operate in said first mode during a first period from occurrence of said first signal to occurrence of said second signal and to operate in said second mode during a second period from occurrence of said second signal to occurrence of said



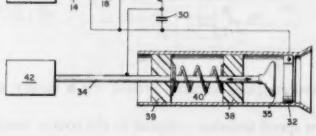
third signal thereby to apply said second pulse train produced by said second means to third means during said first and second periods,
second gate means for applying said first pulse train to said third means during a third period from occurrence of said third signal to occurrence of said first signal, and
said third means for converting the pulses applied thereto into a DC voltage whose amplitude is proportional to the pulse rate of said applied pulses, said DC voltage being applied to said electric motor for driving the same.

4,114,080

EXPLOSION SIMULATING DEVICE

Quentin E. Greenwood, 1508 Granvia Altamira, Palos Verdes Estates, Calif. 90274

Filed Apr. 5, 1977, Ser. No. 784,716
Int. Cl.[2] A63H *33/26, 33/36;* H02J *15/00*
U.S. Cl. 320—1 **10 Claims**



1. An explosion simulation device, comprising:
power input means;
charge regulation means coupled to said power input means for receiving power therefrom and providing energy to energy storage means;
energy storage means for storing energy from said power input means in response to said charge regulation means, said energy storage means having first and second electrodes;
barrel means;
first contact means being coupled to the first electrode of

said energy storage means being disposed in said barrel means;

second contact means being coupled to the second electrode of said energy storage means for making electrical connection with said first contact means for rapidly discharging energy stored in said energy storage means and simulating an explosion, said second contact means being movably mounted within said barrel means; and

support means for movably mounting said second contact means within said barrel means.

4,114,081

Patent Not Issued For This Number

4,114,082

DUAL VOLTAGE BATTERY SYSTEM AND ELECTRONIC SWITCH THEREFOR

Ralph E. Scheidler, 7415 SE. Johnson Creek Blvd., Portland, Oreg. 97206

Filed Jul. 5, 1977, Ser. No. 812,441

Int. Cl.[2] H02J *7/04*

U.S. Cl. 320—7 **16 Claims**

1. A dual voltage battery system, comprising:

(a) first and second batteries of equal voltage rating,

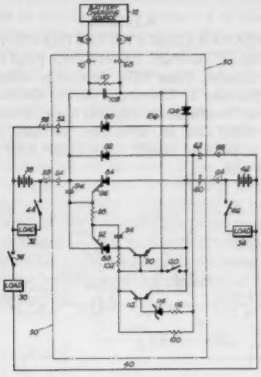
(b) first rectifier means interconnecting the positive terminals of the batteries,

(c) second rectifier means interconnecting the negative terminals of the batteries,

(d) first electrically actuated switch means releasably interconnecting one terminal of the first battery and the opposite polarity terminal of the second battery for connecting the batteries together in series,

(e) first switch actuator means having an electric circuit connected to the first battery and operable by an impulse generated from an instantaneous voltage drop across said battery by connection of a load thereacross to activate the first switch means to connect the batteries together in series,

(f) one of the rectifier means being arranged to block the higher voltage output of the second battery of the series from the first battery, and the other rectifier means being arranged to isolate the positive and negative terminals of the first battery from each other, and



(g) electrical conductors connected across the first switch means and arranged for connection to the positive and negative output terminals of a source of battery charging voltage rated for charging one of said batteries.

4,114,083

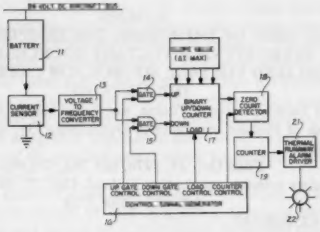
BATTERY THERMAL RUNAWAY MONITOR

Harold L. Benham, Bedford; Steven D. Clark, Crane; Hubert L. Huffman, and Ronald J. Stovall, both of Bedford, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 15, 1977, Ser. No. 806,799

Int. Cl.[2] H02J *7/00;* **H02H** *3/08*

U.S. Cl. 320—39 **5 Claims**



1. A monitoring device for indicating that a thermal runaway condition exists in a nickel-cadmium battery comprising,

a current sensor connected with said battery for developing a direct current voltage proportional to charge current,

a voltage converter connected with said current sensor providing at an output terminal pulse train frequencies directly proportional to charge current,

binary counter means having input terminals for receiving a predetermined count and having an up counting terminal and a down counting terminal,

first gating means connected between said output of said voltage converter and said up counting terminal for adding for a predetermined time the output of said voltage converter to the predetermined count,

second gating means connected between said output of said voltage converter and said down counting terminal for subtracting for a predetermined time the output of said voltage converter from the two added counts, and

an output terminal on said binary counter means for provid-

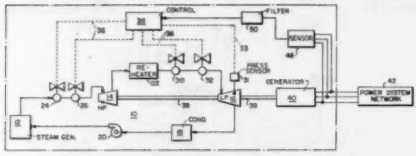
ing an output signal when the down count in said binary counter means exceeds the sum of the two added counts.

4,114,084

TURBINE-GENERATOR PROTECTION SYSTEM WITH ELECTRONIC SAMPLING FILTER

Stephen P. Glaudel, Penn Hills Township, Allegheny County, Pa., and Norman T. Chambers, Indian Harbor Beach, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 26, 1976, Ser. No. 735,718
Int. Cl.² H02H 7/06; H02P 9/04
U.S. Cl. 322—38 **11 Claims**



1. A turbine-generator power generation plant coupled to a power system network, said power plant including an electronic turbine-generator protection system comprising:

first means to generate an electrical signal representative of actual turbine power;

second means to generate an electrical signal representative of actual generator power, said electrical generator power signal including a periodic time varying component; and

third means responsive to said electrical generator power signal to generate a train of fixed time duration electrical signal amplitudes wherein each amplitude of said train is representative of an average of selected amplitudes of said electrical generator power signal; and

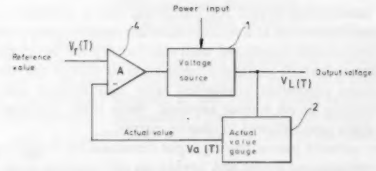
fourth means governed by said electrical turbine power signal and said train of fixed time duration electrical signal amplitudes to reduce at times said turbine power.

4,114,085

METHOD OF IMPROVING THE TEMPERATURE STABILITY OF A VOLTAGE SOURCE, AND A STABILIZED VOLTAGE SOURCE FOR CARRYING OUT THE METHOD

Erkki Ilmari Leinonen, Vantaa, and Erkki Sakari Kiuru, Espoo, both of Finland, assignors to Outokumpu Oy, Ab., Helsinki, Finland

Filed Oct. 27, 1976, Ser. No. 735,983
Claims priority, application Finland, Oct. 27, 1975, 752995
Int. Cl.² G05F 1/58
U.S. Cl. 323—17 **3 Claims**



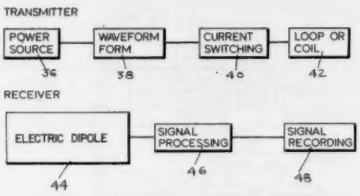
1. In a stabilized voltage source of the type having a temperature-dependent actual voltage gauge which senses the output voltage of the voltage source, a reference value circuit providing a reference value voltage, said reference value circuit comprising a temperature-stable first voltage source and a second voltage source which is strongly dependent on temperature, means for summing the voltage outputs of said first and second voltage source of said reference value circuit, and means for regulating the output voltage of at least one of said first and second voltage sources to control the reference value voltage for regulating the temperature coefficient of the reference value voltage to compensate for temperature dependence of the actual value voltage.

4,114,086

INDUCTIVE SOURCE METHOD OF INDUCED POLARIZATION PROSPECTING

Aleksander Arkadi Kaufman, Downsview, Canada, assignor to Scintrex Limited, Concord, Canada

Filed Mar. 7, 1977, Ser. No. 774,780
Int. Cl.² G01V 3/08
U.S. Cl. 324—1 **2 Claims**



1. In a method of geophysically prospecting a polarizable medium the steps of locating an induction coil in inductive proximity to the medium and transmitting a time varying current therethrough of a magnitude capable of inducing current flow through the polarizable medium sufficient to establish a measureable induced polarization effect;

said time varying current in said induction coil having a first period where it varies unidirectionally for the first period to maintain current flow induced by the induction coil in the medium;

said time varying current in said induction coil having a second period following said first period wherein said time varying current does not vary substantially with respect to time and wherein there are substantially no currents in said medium induced to said induction coil;

said first period of time being sufficiently long in duration for induced polarization effects to build up in the medium;

said second period of time being sufficiently long in duration for the electro-magnetic effects to decay and for measurement of the induced polarization effects in the medium; and

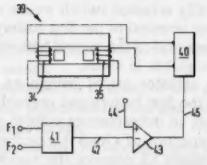
detecting any induced polarization effects that may be present in said second period by measurement of transient electric field components.

4,114,087

MAGNETIC OR ELECTRIC MEASURING DEVICES

Michael George Joseph Fry, Old Coulsdon, England, assignor to Brentford Electric Limited, Crawley, England

Filed Oct. 18, 1976, Ser. No. 733,476
Int. Cl.² G01R 33/08
U.S. Cl. 324—0.5 E **18 Claims**



1. Apparatus for measuring magnetic field strength, comprising: two Nuclear Magnetic Resonance cells (the NMR cells) each containing material having identical gyromagnetic

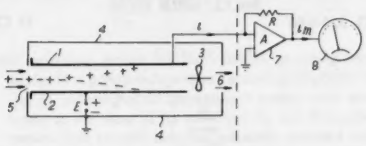
properties as the other; field generating means for applying simultaneously to both said NMR cells bias magnetic field which is parallel and of substantially equal strength at each NMR cell, such that when the NMR cells further simultaneously receive test magnetic field which is of substantially equal strength at each NMR cell, and which is parallel to, and at one NMR cell is in the same direction, and at the other NMR cell is in the opposite direction to, the bias field at said respective NMR cells, resultant magnetic fields of strengths equal to the sum and difference of the strengths of the bias and test fields will be experienced simultaneously by said one and said other NMR cell respectively; means for individually magnetically exciting each NMR cell only at its own precise Larmor precession, or resonance frequency as determined by said gyromagnetic properties and by the magnitude of the resultant magnetic field strength at that NMR cell; and means for deriving a resultant signal in accord with the difference between the Larmor frequencies of the two NMR cells, said resultant signal being representative of the magnitude of said test magnetic field.

4,114,088

ATMOSPHERIC ION DENSITY MEASUREMENT

Christopher Malcolm Laws, Old Oxted, England, assignor to Cecil Alfred Laws, England

Filed Feb. 28, 1977, Ser. No. 772,646
Int. Cl.[2] G01N *27/00*
U.S. Cl. 324—33 **10 Claims**



1. An ion counter comprising an electrometer, a collector and a voltage source, wherein said collector comprises insulators, a flat polarizing plate, screening members and a first and a second flat collector plate, said collector plates being spaced by said insulators from and arranged either side of, so as to extend in planes which are substantially parallel to the plane of, said flat polarizing plate so as to form a first and a second air passage between the latter and a respective one of said collector plates, and said screening members are provided along the margins of the air passages with a predetermined insulation resistance between them and the collector plates, the arrangement being such that, in use of the ion counter, said voltage source is connected to maintain said screening members at the same potential as the collector plates, and whereby a substantially uniform potential gradient can be preserved across the insulators, random charges are dispersed and a substantially linear field is maintained between said polarizing plate on the one hand and said collector plates and screening members on the other hand over substantially the whole area of said passages in said planes and with substantially no field edge-effects between said collector plates and said screening members.

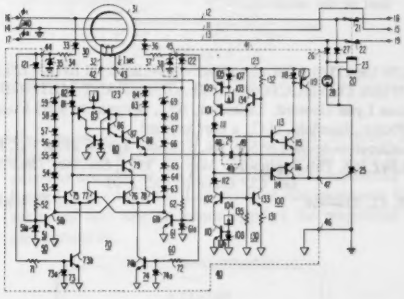
4,114,089

GROUND FAULT DETECTING APPARATUS INCLUDING CURRENT-RESPONSIVE THRESHOLD DETECTION CIRCUITRY

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 560,721, Mar. 21, 1975, Pat. No. 4,037,155, which is a division of Ser. No. 461,268, Apr. 15, 1974, Pat. No. 3,953,767. This application Dec. 17, 1976, Ser. No. 751,588
Int. Cl.[2] G01R *31/02, 19/16;* H02H *1/04*
U.S. Cl. 324—51 **9 Claims**

9. In ground-fault detection apparatus for a power distribution system with a plurality of a-c power line conductors, said apparatus including differential current sensing means for responding to total current flow through said a-c power line conductors in one direction differing from total current flow through said a-c power line conductors in the opposite direction to provide an a-c signal representative of that difference; synchronous detection means having a first input circuit to which the a-c signal provided by said differential current sensing means is applied, having a second input circuit to which the a-c potential appearing between a pair of the a-c power line conductors is applied, and having an output circuit for supplying a product signal proportional to the product of the a-c signal provided by said differential current sensing means times said a-c potential appearing between a pair of the a-c power line conductors; and means for determining whether or not said product signal has a direct component of an amplitude and duration indicative of the presence of a resistive ground fault, the improvement wherein said means for determining whether or not said product signal has a direct component of an amplitude and duration indicative of the presence of said resistive ground fault comprises:



integrating means having an input circuit to which said product signal is applied, having an output circuit, and being of a type responsive to the product signal applied to its input circuit to provide at its output circuit integrated response to rectified sinusoidal components of the product signal which components are of amplitude greater than a threshold value and of duration of at least the better part of a half cycle of a-c power line potentials, which response is of a relatively high sensitivity compared to the sensitivity of its integrated response to short-lived transient components of the product signal which have similar average power level; and

threshold detector means having an input circuit to which the output circuit of said integrating means is directly coupled, and having an output circuit exhibiting response to the signal applied to its input circuit exceeding a threshold value, for providing an indication of whether or not a resistive ground fault is present on any of the a-c power line conductors.

4,114,090

ELECTRONIC MOISTURE METER

Walter Edward Poskitt, St. Basile le Grande, Quebec, Canada, assignor to IMASCO Limited, Montreal, Canada

Filed Aug. 17, 1976, Ser. No. 715,170
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—61 QS **10 Claims**

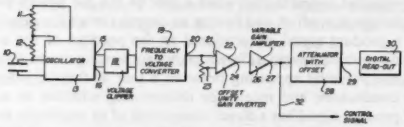
1. A moisture detection unit comprising:

a capacitor sensor for sensing the moisture content of the material the moisture content of which is to be detected and which is positioned in the vicinity of the sensor, said capacitor sensor attaining a value of capacitance proportional to that moisture content;

at least one resistor interconnected with said capacitor sensor to form a resistance-capacitance network;

a free-running oscillator means connected to said resistance-capacitance network for producing an output signal the frequency of which is inversely proportional to the capacitance of said capacitor sensor and is from 0 to 10 KHz;

a frequency-to-voltage converter connected to said free-running oscillator means for producing a D.C. voltage proportional to the frequency of the output signal of said free-running oscillator means; and



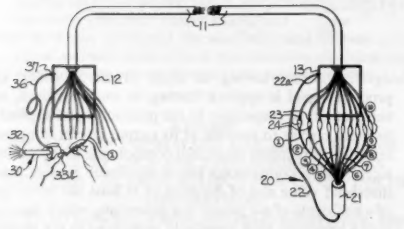
an inverter connected to said frequency-to-voltage converter for producing an output voltage inversely proportional to the D.C. voltage of the frequency-to-voltage converter and directly proportional to the moisture content of the material.

4,114,091

APPARATUS FOR MATCHING WIRES IN MULTIPLE WIRE CONDUCTORS AND ATTENDANT METHOD

James Lynn Howard, Lancaster, S.C., assignor to Earl Cooper Phifer, Stanfield, N.C., a part interest

Continuation-in-part of Ser. No. 673,660, Apr. 5, 1976, Pat. No. 4,041,383. This application May 23, 1977, Ser. No. 799,379
Int. Cl.[2] G01R *31/02, 1/06*
U.S. Cl. 324—66 **10 Claims**



1. Apparatus for matching the corresponding opposite end portions of wires located at opposite ends of a multi-wire conductor, said apparatus being particularly suited for operation by one person, thereby avoiding the necessity of having persons at both ends of the conductor for matching and identifying the wires, said apparatus comprising, in combination, a diode assembly adapted to be connected to the respective wires at one end of the conductor and a direct current circuit tester adapted to be employed at the opposite end of the conductor to test the respective wires for a complete circuit, thus indicating a match with a particular one of the wires at the opposite end of the conductor; said diode assembly including a plurality of diodes having respective pairs of leads and electrically interconnected in series in alternating polarity, means for temporarily connecting corresponding leads of the respective series-interconnected diodes to the respective wires at one end of the conductor, and means for connecting the remaining free lead of the first diode of the series to a common ground connection; said direct current circuit tester including an elongate tubular housing of a size suited to be readily held in one hand by a person using the circuit tester and having a hollow interior portion adapted for receiving at least one battery therein, a pair of probe means and an indicator means carried by the housing and being operably interconnected for cooperating with a battery received in said housing and indicating the presence of an electrically conductive path connected between the respective probe means, reversing switch means operably associated with said probe means and carried by the housing and including a manually actuable handle portion located at one end of the housing for effecting reversing of the polarity of said probe means, and wherein the handle portion of said switch means is electrically conductive and comprises one of said probe means and the other of said probe means comprising an elongate flexible conductor lead extending from said housing.

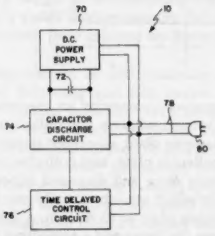
6. A hand-held circuit tester adapted to test for the presence of an electrically conductive path between two test points, said circuit tester comprising a pair of probe means, a direct current power source, and indicator means all electrically interconnected and operable for indicating the presence of an electrically conductive path between two test points connected to the respective probe means, reversing switch means cooperating with said probe means to permit reversing the polarity of the probe means, said reversing switch means including a handle portion positioned to facilitate readily actuating the reversing switch by someone using the circuit tester, and wherein the handle portion of said switch means is electrically conductive and comprises one of said probe means.

4,114,092

POWER CIRCUIT IDENTIFIER WHICH PRODUCES A VOLTAGE PULSE IN RESPONSE TO INTERRUPTION OF POWER

James H. Fry, Jr., P.O. Box 230, Columbia, Pa. 17512

Filed Jul. 25, 1977, Ser. No. 818,923
Int. Cl.[2] G01R *19/16*
U.S. Cl. 324—66 **11 Claims**



1. An apparatus for identifying which of several sources is the source of one power line out of a group, which comprises:

a direct curent power supply means;

a capacitor electrically connected to and charged by the power supply means; and

a switching means electronically connected to one location on the power line being identified and a common circuit return, and activated by the interruption of power on the power line, also connected to the capacitor and switching the capacitor across the power line and the common circuit return upon interruption of power on the power line whereby interruption of power at the source of the power line, remote from the location of connection of the identifying apparatus, produces a voltage pulse from the capacitor, which when detected at the source, verifies that the power line which has been interrupted is the one to which the apparatus is attached.

4,114,093

NETWORK TESTING METHOD AND APPARATUS

Lewis Frank Long, Alta Loma, Calif., assignor to Everett/-Charles, Inc., Pomona, Calif.

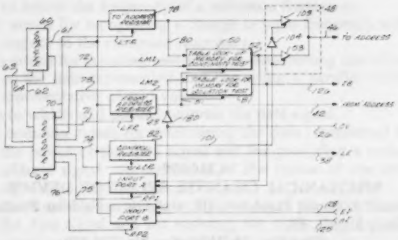
Filed Dec. 17, 1976, Ser. No. 751,989
Int. Cl.[2] G01R *15/12*
U.S. Cl. 324—73 AT **11 Claims**

1. A continuity-check testing apparatus for testing a network having a plurality of network nodes, the network when con-

forming to its design having a predetermined node-connection pattern defining a division of the network nodes into a plurality of groups of network nodes with each network node being connected in common to all other network nodes in its group and being isolated from the network nodes in each other group, the apparatus comprising:

continuity verifying means having a first input node connectable to a presently scanned node, a second input node connectable to a present verification-tested node, and means for providing a signal specifying whether continuity exists between the first and second input nodes when they are connected to the scanned and tested nodes; and

timing and control means for connecting the first and second input nodes to selected network nodes to verify that each network node is in fact connected in conformity to the design, the timing and control means including:



first selecting means for individually selecting network nodes in a group-independent scanning sequence defining an ordering of all the network nodes, each network node at the time of its selection by the first selecting means then constituting the presently scanned node;

first switching means for connecting the presently scanned node to the first input node;

second selecting means for individually selecting network nodes by reference to their order in a group-dependent sequence progressing such that as to each group network nodes thereof are sequentially selected by the second selecting means in the same order that they are sequentially selected by the first selecting means, each network node at the time of its selection by the second selecting means then constituting the presently verification-tested node; and

second switching means for connecting the presently verification-tested node to the second input node.

4,114,094

LONG SCALE DISPLAY

John Gerald Cook, Farnborough, and Julian David Shaw, Crowthorne, both of England, assignors to The Solartron Electronic Group Ltd., Farnborough, England

Filed Sep. 8, 1975, Ser. No. 611,037

Claims priority, application United Kingdom, Sep. 20, 1974, 41008/74

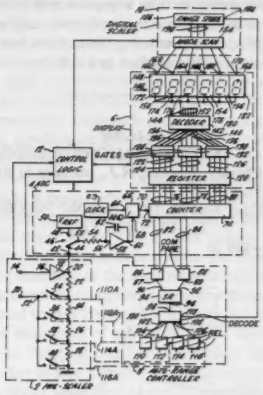
Int. Cl.[2] G01R *15/08, 17/06*

U.S. Cl. 324—115 **7 Claims**

1. An instrument for measuring and displaying digitally the magnitude of at least one parameter of an electrical input signal, which magnitude can lie in any one of M successive decade ranges, where M is an integer, the instrument comprising:

signal conversion means for receiving the input signal and converting it to a digital output signal which is representative of the magnitude of said parameter and has up to N significant figures, where N is an integer less than M, the signal conversion means including scaling means operative to maintain said digital output signal within a predetermined range, and means coordinated with said scaling means for producing a range signal indicative of the range in which the magnitude of said parameter lies;

display means having at least M decades each of which represents a fixed order of magnitude of said parameter; and



control means responsive to the range signal to direct the digital output signal to the respective group of up to N adjacent decades of the display means corresponding to the range in which the magnitude of said parameter lies, such that said display means displays the magnitude of said parameter.

4,114,095

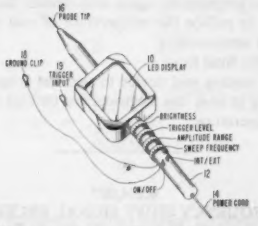
SOLID STATE OSCILLOSCOPE

Jacques Isaac Pankove, Princeton, and Frank Jerome Marlowe, Kingston, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,864

Int. Cl.[2] G01R *13/20, 13/00;* **G08B** *23/00*

U.S. Cl. 324—121 R **6 Claims**



1. An oscilloscope comprising, in combination:

a display comprising a plurality of columns and a plurality of rows of light affecting elements integrated onto a common sapphire substrate, each element being capable of assuming one of two optically distinguishable conditions, each element being responsive to coincident selection signals, one on a column, the other on a row, for being placed in said one condition and each remaining in its other condition in response to only one of said selection signals;

means integrated onto the same substrate as said display responsive to a test waveform for selecting particular rows of the display during successive time slots, the row selected depending upon the amplitude of said waveform during that particular time slot that the selection takes

place, and for supplying to each selected row a selection signal only during the time the row is selected; and

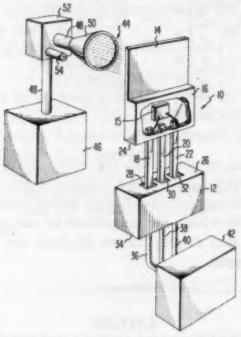
means also integrated onto the same substrate as said display for applying to said plurality of columns, a corresponding plurality of selection signals, respectively, said selection signals occurring in time sequence and being applied in succession to the successive columns, each said selection pulse applied to a row being time coincident with one of said selection pulses applied to a column.

4,114,096

METHOD OF TESTING SEMICONDUCTOR DEVICES

Jack Joseph Chinery, Raritan, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 25, 1977, Ser. No. 790,199
Int. Cl.² G01R *31/22*
U.S. Cl. 324—158 D **8 Claims**



1. A method of testing a semiconductor device which has a semiconductor chip integral therewith, at a particular test temperature which is much lower than room temperature, said chip having at least one PN junction therein, comprising the steps of:

locally directing a fluid which is at a temperature lower than said test temperature upon said device for a time long enough to reduce the temperature of said device below said test temperature;

stopping the fluid flow;

internally heating said device to said test temperature; and

performing at least one electrical test on said device at said test temperature.

4,114,097

FREQUENCY SHIFT SIGNAL RECEIVER

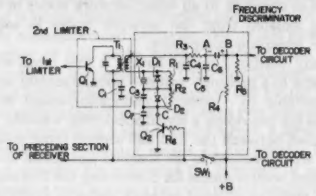
Noriyoshi Kubo; Takeshi Katano; Yoshinobu Tatsuzawa, all of Yokohama; Tadatoshi Hagihira, Sagamihara; Masahiko Yamamoto, Tokyo, and Hiromi Wasai, Kyoto, all of Japan, assignors to Nippon Telegraph and Telephone Public Corp., Tokyo and Matsushita Electric Industrial Co., Ltd., Kadoma, both of, Japan

Filed Oct. 28, 1975, Ser. No. 626,098
Claims priority, application Japan, Oct. 29, 1974, 49/125015
Int. Cl.² H04B *1/16*
U.S. Cl. 325—320 **3 Claims**

1. A frequency shift receiver including a frequency discriminator for receiving a frequency shift signal comprising:

first switching means connected between a power source and a preceding section of said receiver for periodically supplying power from said power source to said preceding section, and

second switching means connected to said frequency discriminator for turning on and off an output of said frequency discriminator in synchronism with the turning on and off operation of said first switching means.

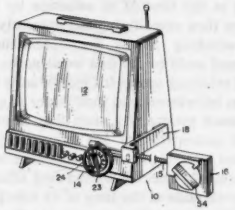


4,114,098

MECHANICAL CHANNEL SELECTOR DEVICE

Donald J. Booty, Frankfort, Ill., assignor to Feldmar Products, Inc., Skokie, Ill.

Filed Sep. 24, 1976, Ser. No. 726,479
Int. Cl.² H04B *1/06*
U.S. Cl. 325—390 **8 Claims**



1. A mechanical channel selector device for the remote switching of channels of a television receiver having a housing and a receiver channel shaft, including in combination:

switching means coaxially and adjustably mounted to the television channel receiver shaft;

bracket means mounted to the television receiver housing adjacent said switching means;

cable connector means slidably mounted to the television receiver housing by said bracket means and attached to said switching means, said cable connector means including a cable member positioned within a sleeve member, said sleeve member adapted to be engaged by said bracket means to fixedly anchor said sleeve member, with said bracket means providing alignment of said connector means with said switching means to permit the axial movement of said cable member therein; and

control means operatively connected by said cable connector means to said switching means said control means being rotatable between a first at rest position to a second actuated position, said rotational movement of said control means from said first to said second position causing said cable member to axially move therewith and rotate said switching means and the television receiver channel shaft to the next television receiver channel to predeterminely index the same.

4,114,099
ULTRASONIC TELEVISION REMOTE CONTROL SYSTEM

Harry Hollander, P. O. Box 21, Braeside, Ontario, Canada

Filed Dec. 16, 1976, Ser. No. 751,181
Claims priority, application Canada, Apr. 1, 1976, 249238
Int. Cl.[2] H04B 7/00
U.S. Cl. 325—392 25 Claims

1. An ultrasonic remote control system comprising:

(a) means for receiving a pulse modulated continuous wave ultrasonic signal at a first predetermined frequency, each pulse being immediately followed by a continuous wave ultrasonic signal at a second predetermined frequency which has amplitude such as to mask echoes of the first predetermined frequency at the receiving means, the pulses being representative of transmitted data,

(b) means to determine whether the received signal is above or below the frequency of a reference frequency,

(c) means for recognizing a change in input frequency with respect to the reference frequency,

(d) means for counting said changes, determining the values of the data represented and providing a parallel coded representative of said value,

(e) in which said pulses comprise the data signal,

(f) counting means for determining the data represented by the pulses of the data signal and for providing a coded address signal representative of the values of the data represented by said pulses,

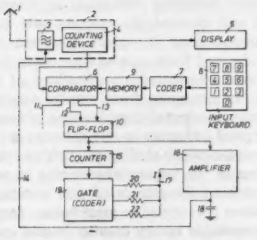
(g) means for generating clock pulses upon the reception of the data signal and for applying the clock pulses to the counting means for operating the counting means at particular times, and

(h) means for enabling the counting means upon the reception of data.

4,114,100
RAPID TUNING CIRCUIT FOR HIGH FREQUENCY RECEIVERS

Otto Klank, Arpke, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 8, 1977, Ser. No. 814,103
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632025
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—453 11 Claims

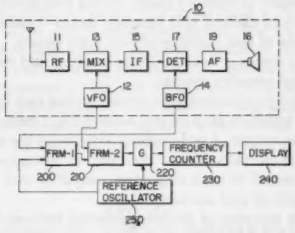


1. In a tuning circuit for a high frequency receiver, which circuit includes a voltage controllable superheterodyne oscillator arranged to receive a control voltage and to produce an oscillation whose frequency is determined by the value of the control voltage and determines the broadcast frequency to which the receiver is tuned, a counter connected to sense the frequency of the oscillations being generated by the oscillator and to produce therefrom a count state in the form of representations of the digits of a first decimal number identifying the broadcast frequency to which the receiver is currently tuned, input means for generating representations of the digits of a second decimal number identifying the broadcast frequency to which it is desired to tune the receiver, and a comparison circuit for comparing the decimal number representations being produced by the counter and the input means in order to vary the control voltage in a direction to cause those two number representations to coincide, the comparison circuit including a comparator capable of comparing the representations of one digit of each of two numbers and having two inputs connected, respectively, to the counter and to the input means, the comparator being arranged to receive, at one of its inputs, each digit representation produced by the counter, starting with the most significant digit, and, at the other of its inputs, simultaneously therewith each digit representation of corresponding significance generated by the input means, the comparator including a first output providing a signal when the digit representations at its inputs are identical, a second output providing a signal when the digit representation at its one input represents a value larger than that of the digit representation at its other input, and a third output providing a signal when the digit representation at its one input represents a value smaller than that of the digit representation at its other input, the improvement comprising: tuning voltage adjustment means connected to said comparator outputs and responsive to the number of sequences of termination of a signal at one of said second and third outputs and subsequent initiation of a signal at the other of said second and third outputs for varying the control voltage at a rate inversely proportional to such number of sequences.

4,114,101
DIGITAL FREQUENCY DISPLAY DEVICE

Tadao Sekiguchi, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1977, Ser. No. 767,832
Int. Cl.[2] H04B 1/26
U.S. Cl. 325—455 9 Claims



1. A digital frequency display device for displaying digits representative of the operating frequency of a communication apparatus comprising:

a reference frequency oscillator;

a first frequency mixer for mixing the output frequencies of a first oscillator of the communication apparatus and of said reference frequency oscillator;

a second frequency mixer for mixing the output frequency of a second oscillator of the communication apparatus and the output frequency from said first frequency mixer to produce a frequency corresponding to the frequency to be displayed but shifted by the reference frequency;

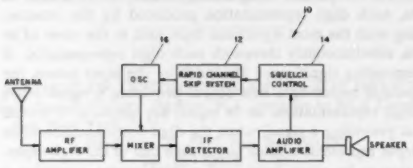
a frequency counter including correcting means for eliminating said shifted frequency component for counting the output frequency from said second frequency mixer; and

display means connected to said frequency counter for displaying digits representative of the operating frequency.

4,114,102
RADIO CHANNEL SKIP SYSTEM

Quentin S. Denzene, Waseca, Minn., assignor to E. F. Johnson Company, Waseca, Minn.

Filed Dec. 23, 1976, Ser. No. 753,684
Int. Cl.[2] H04B 1/32
U.S. Cl. 325—470 30 Claims



1. Rapid channel skip system for use in a radio receiver and connected in said receiver between a squelch control and an oscillator comprising

(a) manual-scan means having a manual mode of operation and a scan mode of operation;

(b) clock oscillator means connected to said manual-scan means;

(c) means connecting said clock oscillator means to said squelch control of said radio receiver;

(d) counter means connected to said clock means and having a plurality of outputs, each of said outputs corresponding to an individual channel of a predetermined frequency;

(e) skip oscillator means connected to said counter means;

(f) plurality of first logic means having two inputs, one of said inputs of each of said first logic means connected to each of said plurality of outputs of said counter;

(g) channel skipping means connected between said manual-scan means and the other of said inputs of each of said first logic means;

(h) plurality of memory means having two inputs, one of said inputs of each of said memory means connected to each output of said plurality of first logic means;

(i) reset means connected to the other of said inputs of each of said memory means;

(j) plurality of second logic means having two inputs, one of said inputs of each of said second logic means connected to the output of said memory means and the other of said inputs of each of said plurality of second logic means connected to each respective output of said plurality of outputs of said counter;

(k) first plurality of diodes connected between each of the outputs of said plurality of second logic means and said skip oscillator means, and;

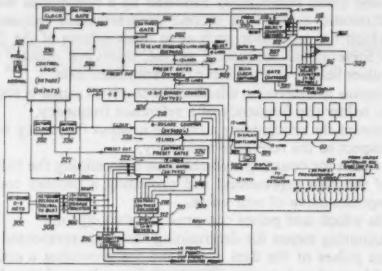
(l) second plurality of diodes respectively connected to each of said counter outputs, said one input of said first logic means, and said other input of said second logic means;

(m) plurality of crystals of predetermined frequencies, one crystal per channel, connected between each of said second plurality of diodes and said oscillator whereby said clock oscillator means drives said counter to cyclically scan and receive seriatim each of said channels in regular sequence and a voltage differential received by said connecting means stops said clock oscillator means to receive the radio frequency signal on a particular channel scanned and whereby activating said channel skipping means while receiving the signal on the particular channel generates a short pulse to set said memory means so that the channel is inhibited and skipped on subsequent scanning cycles by enabling said skip oscillator means for each scanning cycle on said inhibited channel.

4,114,103
CRYSTALLESS SCANNING RADIO RECEIVER

Peter W. Pflasterer, Oak Ridge, Tenn., assignor to Masco Corporation of Indiana, Taylor, Mich.

Continuation-in-part of Ser. No. 586,178, Jun. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 450,983, Mar. 14, 1975, Pat. No. 3,961,261. This application May 28, 1976, Ser. No. 690,881
Int. Cl.[2] H04B 1/32, 1/06
U.S. Cl. 325—470 15 Claims



1. A receiver for scanning a plurality of channels of predetermined radio frequency channels and selecting one channel having a radio frequency signal thereon said receiver comprising:

an RF section including at least one RF amplifier and an associated mixer coupled to said amplifier;

means for generating one of a plurality of beating signals of preselected frequency for application to said mixer to tune a received channel signal and provide an intermediate signal in response to said channel signal;

said beating signal generating means comprising a phase-locked-loop frequency synthesizing means having at least one input thereto, wherein various preselected combinations of signals applied to said input produces said beating signals of preselected frequencies at the output of said generating means;

programmable memory means connected to said input for storing said various preselected combinations of signals at predetermined addresses;

means for programming said memory means, said programming means including numerical keyboard means for manually and successively entering said various preselected combinations of signals into said programming means in decimal form, conversion means for converting said various preselected combinations of signals from decimal form into binary form, storage means for entering said various preselected combinations of binary signals at predetermined addresses in said memory means;

said conversion means including resettable keyboard storage register means for sequentially storing in serial by digit fashion each of the signals of said various preselected combinations of signals, presettable decade counter means, presettable binary counter means, means for presetting said decade counter to a predetermined value corresponding to a particular frequency in a predetemined band, means for presetting said presettable binary counter to a predetermined binary value upon entry of the first of said signals within said various preselected combination of signals, means for operating said presettable binary counter means and said presettable decade counter means in parallel, means for separately determining the most significant digit contained in said decade counter means upon each successive entry of said various preselected combinations of signals into said programming means, means for comparing the value of said determined most significant digit in said presettable decade counter with the value of a corresponding signal stored in said key-

board storage register means, control means responsive to said comparing means for resetting said resettable keyboard storage register means when said compared most significant digit value equals the value of said signal stored in said keyboard storage register means, said control means terminating operation of said conversion means upon entry of the last signal within said various preselected combination of signals for retaining said preselected combination of signals in said presettable decade counter means and said presettable binary counter means;

means connected to said memory means for selectively addressing said combinations to thereby cause said selected combinations to be applied to said input;

an IF section connected to said mixer and including an IF amplifier for amplifying said intermediate signal;

detector means for producing audio signals when said intermediate signal is being received; and,

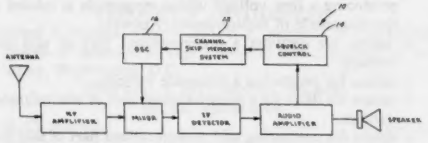
an audio amplifier connected to said detector means for amplifying said audio signals.

4,114,104

CHANNEL SKIP MEMORY SYSTEM FOR RADIO RECEIVER

Quentin S. Denzene, Waseca, Minn., assignor to E. F. Johnson Company, Waseca, Minn.

Filed Nov. 15, 1976, Ser. No. 741,868
Int. Cl.[2] H04B *1/32*
U.S. Cl. 325—470 **29 Claims**



1. Channel skip memory system for use in a radio receiver and connected in said receiver between a squelch control and an oscillator comprising

(a) manual-scan means having a manual mode of operation and a scan mode of operation;

(b) clock means connected to said manual-scan means;

(c) means connecting said clock means to said squelch control of said radio receiver;

(d) counter means connected to said clock means and having a plurality of outputs, each of said outputs corresponding to an individual channel of a predetermined frequency;

(e) plurality of first logic means having two inputs, one of said inputs of each of said first logic means connected to each of said plurality of outputs of said counter;

(f) channel skipping means connected to the other of said inputs of each of said first logic means;

(g) plurality of memory means having two inputs, one of said inputs of each of said memory means connected to each output of said plurality of first logic means;

(h) reset means connected between said manual-scan means and the other of said inputs of each of said memory means;

(i) plurality of second logic means having two inputs, one of said inputs of each of said second logic means connected to the output of said memory means and the other of said inputs of each of said plurality of second logic means connected to each respective output of said plurality of outputs of said counter;

(j) plurality of diodes connected to each of the outputs of said plurality of second logic means, and;

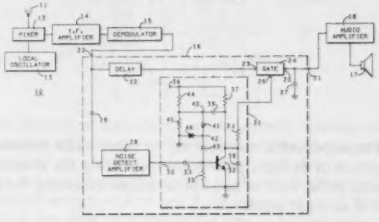
(k) plurality of crystals of predetermined frequencies, one crystal per channel connected between each of said plurality of diodes and said oscillator whereby said clock means drives said counter to cyclically scan and receive seriatim each of said channels in regular sequence and a voltage differential received by said connecting means stops said clock means to receive the radio frequency signal on a particular channel scanned and whereby actuating said channel skipping means while receiving a signal on one of said plurality of channels generates a short pulse to reset said memory means for the particular channel being received so that the channel is skipped on subsequent scanning cycles.

4,114,105

NOISE BLANKER CIRCUIT

Herbert Alan Duncan, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 27, 1977, Ser. No. 810,215
Int. Cl.[2] H04B *1/10*
U.S. Cl. 325—480 **10 Claims**



1. A noise blanker circuit for elimanating noise in a received signal, comprising:

gate means for receiving a signal with noise pulses on it and selectively passing said received signal in accordance with control signals received by said gate means;

noise detector means for detecting noise pulses having variable rates on said received signal and producing output signals having variable rates in response to the detected noise pulses; and

control means including an amplifier coupled to said noise detector means and said gate means for producing said control signals in response to said output signals, said amplifier having AC negative feedback circuitry including a voltage variable impedance, said control means also including rectifier circuitry for developing a DC voltage related to the rate of said output signals, said DC voltage coupled to said voltage variable impedance for control thereof to substantially reduce the AC gain of said amplifier in response to the rate of said output signals being above a predetermined rate, whereby said gate control signals are produced for blanking noise on said received signals only when noise occurs at a rate below a predetermined rate.

4,114,106

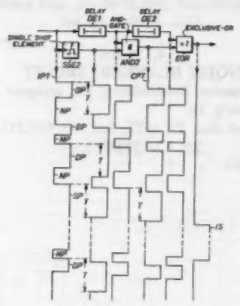
ARRANGEMENT TO INDICATE SIGNALS HAVING A LENGTH EXCEEDING A LIMIT VALUE

Folke Lennart Mårtensson, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Dec. 28, 1976, Ser. No. 755,035
Claims priority, application Sweden, Jan. 23, 1976, 7600714
Int. Cl.[2] H03K *17/00*
U.S. Cl. 328—111 **6 Claims**

1. In a system for transmitting data as a train of input pulses including data pulses having durations greater than a given time and disturbing pulses having durations less than the given time, apparatus for indicating the reception of each data pulse and the suppression of any disturbing pulses comprising: control pulse generating means for generating a train of control pulses, said control pulse generating means including means responsive to the leading edge of an input pulse of the input pulse train to start the generation of a control pulse and means responsive to the trailing edge of said input pulse in the input pulse train to terminate the control pulse if the time between

the leading and trailing edges of said input pulse is less than said given time and otherwise terminating the control pulse said given time after the start of its generation; and sampling means coincidently responsive to the train of control pulses



and input pulses for only emitting an output pulse when at least a portion of an input pulse is present during the absence of a control pulse, each of said output pulses indicating the reception of an input pulse.

4,114,107

REMOTELY FED INTERMEDIATE AMPLIFIER FOR COMMUNICATION LINES

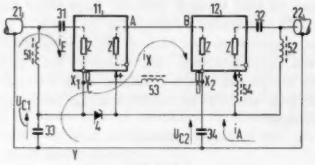
Helmut Bauch, Starnberg; Karl Heinz Möhrmann, and Frithjof Koppehele, both of Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 11, 1977, Ser. No. 795,706

Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623412

Int. Cl.² H03F *3/60*

U.S. Cl. 330—56 **12 Claims**



1. A remotely-fed intermediate amplifier, especially for coaxial communication lines in which said amplifier is arranged between an input line and an output line which have their outer conductors electrically connected together and said intermediate amplifier, said outer conductors and a supply voltage connection have the same alternating voltage reference potential and are capacitively connected, and wherein said amplifier comprises at least two sub-partial amplifiers (11, 12), having first and second input terminals, a pair of capacitors (33, 34) each connected with one side to said outer conductors, a first one of said pair of capacitors having its other side connected to the first input terminal of a first one of said pair of partial amplifiers, a second one of said pair of capacitors having its other side connected to the first input terminal of a second one of said pair of partial amplifiers, and said first and second input terminals (0, +) of said two sub-partial amplifiers (11,12) decoupled from each other relative to high frequency currents.

4,114,108

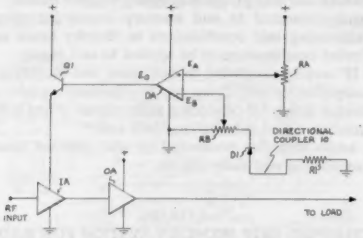
OVERDRIVE PROTECTION CIRCUIT

Wayne J. Faulkenberry, and Henry W. Riviere, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed May 19, 1977, Ser. No. 798,655

Int. Cl.² H03F *21/00*

U.S. Cl. 330—207 P **6 Claims**



1. An overdrive protection circuit for a radio transmitter or the like having a radio frequency amplifier circuit with an input, a control terminal, and an output, said protection circuit comprising:

a. means for sensing the magnitude of radio frequency power produced at said radio frequency amplifier output and producing a first voltage whose magnitude is related to the magnitude of radio frequency power;

b. means for deriving a predetermined part of said first voltage;

c. means for producing a reference voltage;

d. means for deriving a predetermined part of said reference voltage;

e. means for comparing said predetermined part of said first voltage with said predetermined part of said reference voltage and producing a control signal whose magnitude varies as a function of said compared predetermined parts within a safe predetermined range, and whose magnitude is limited to a predetermined safe value outside said safe predetermined range;

f. and means connecting said comparing means to said control terminal of said radio frequency amplifier circuit for applying said control signal to said control terminal and controlling the power produced by said radio frequency amplifier circuit as a function of the magnitude of said control signal.

4,114,109

AMPLIFYING CIRCUIT

Armando Campioni, Turin, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Rivalta (Turin), Italy

Division of Ser. No. 671,645, Mar. 29, 1976. This application May 3, 1977, Ser. No. 793,344

Claims priority, application Italy, Apr. 9, 1975, 67907 A/75; May 19, 1975, 68285 A/75

Int. Cl.² H03F *3/26*

U.S. Cl. 330—267 **6 Claims**

1. A large bandwidth amplifier capable of amplifying a signal having both a d.c. component and an a.c. component, for providing voltages for driving a user device whose impedance varies with frequency, comprising:

first and second amplifier elements, such as transistors, connected in a complementary symmetrical configuration;

said amplifier elements each having an output electrode, a control electrode, and a common electrode;

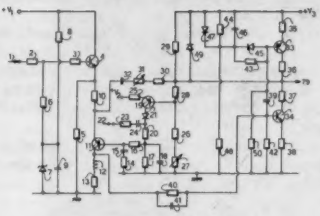
a first constant impedance means connecting one of said common electrodes to a source of supply voltage;

a second constant impedance means connecting the other of said common electrodes to a reference potential;

means for connecting said output electrodes of said first and

second amplifier elements together and to the output terminal of said large bandwidth amplifier;

means for feeding a signal having both a d.c. and an a.c. component to the amplifier directly to the control electrode of said first amplifier element;



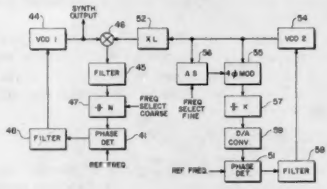
a coupling capacitor connected to said control electrode of said first amplifier element and to said control electrode of said second amplifier element, whereby said second amplifier control electrode receives only the a.c. component of said signal; and

means connecting the control electrode of said second amplifier element to a source of constant biasing potential.

4,114,110
FREQUENCY SYNTHESIZER

Edward J. Nossen, Cherry Hill, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 1, 1977, Ser. No. 856,448
Int. Cl.² H03B *3/04*
U.S. Cl. 331—2 **10 Claims**



1. A frequency synthesizer comprising a first phase lock loop including first voltage-controlled oscillator means, first phase detector means coupled to clock means, a divide by N counter coupled between the output of the first voltage-controlled oscillator means and the first phase detector means, the value of N being used for coarse frequency selection, and first low pass filter means for coupling an output signal from the first phase detector means to control the frequency of the synthesized output signal from the first voltage-controlled oscillator means;

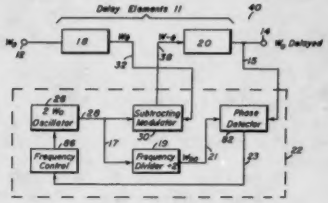
a second phase lock loop including a second voltage-controlled oscillator means, a phase modulator means coupled to the output of the second voltage-controlled oscillator means, second phase detector means coupled to an output of the phase modulator means and to clock means, and second low pass filter means for coupling an output signal from the second phase detector means to control the frequency of the second voltage-controlled oscillator means, said second phase lock loop further including an arithmetic synthesizer for fine frequency selection with its output supplied to said phase modulator means; and

loop coupling means for coupling a signal derived from the output of said second voltage-controlled oscillator means to the first phase detector means of the first phase lock loop.

4,114,111
CONSTANT PHASE DELAY NETWORK HAVING A COHERENT REFERENCE

Paul N. Winters, P.O. Box 327, Trumann, Ark. 72472

Filed May 23, 1977, Ser. No. 799,445
Int. Cl.² H03B *3/04*; H04B *3/36*
U.S. Cl. 331—23 **10 Claims**

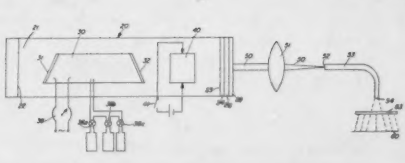


1. A method of maintaining a substantially constant phase relationship between transmitted energy at input and output terminals of an energy transmission network having energy storing delay elements producing a change in phase of the transmitted energy with respect to an input frequency thereof, including the steps of: dividing the energy storing delay elements into two separate portions respectively producing equal changes in phase of the transmitted energy; passing the transmitted energy from said input terminal through one of said divided delay portions to phase shift the transmitted energy; locking an oscillator at a reference phase angle to the input frequency, said oscillator operating at twice the input frequency; subtracting the input frequency of the transmitted energy passed through said one of the divided delay portions from the oscillator frequency at said reference phase angle to reverse the phase shift of the transmitted energy passed through said one of the divided delay portions, and passing the energy resulting from said subtracting step through the other of said divided delay portions to said output terminal whereby the phase shift effected by the said other of the divided delay portions produces a net change in phase substantially equal to zero.

4,114,112
APPARATUS AND METHOD FOR EFFICIENT SYNTHESIS OF LASER LIGHT

Max Epstein, Highland Park; Michel E. Marhic, Evanston, and Samuel E. Schacham, Chicago, all of Ill., assignors to Northwestern University, Evanston, Ill.

Filed Dec. 22, 1976, Ser. No. 753,292
Int. Cl.² H01S *3/10*
U.S. Cl. 331—94.5 C **17 Claims**



1. Apparatus for transmitting laser radiation characterized by three discrete wavelengths corresponding to red, blue, and green light through a conductive medium without substantial competition among said discrete wavelengths, said apparatus comprising

(a) a laser simultaneously emitting three discrete wavelengths of radiation corresponding to red, blue and green light, and including an optical resonant cavity and an optical axis,

(b) three filter means, each said filter means being differen-

tially transmissive with respect to a discrete wavelength of radiation corresponding to red, blue and green light respectively,

(c) means for successively interposing and removing each of said filter means with respect to said optical axis, thereby to generate a laser beam characterized by a succession of three discrete wavelengths, and

(d) means for focusing the laser beam generated by said laser to impinge upon said conductive medium for transmission therethrough.

4,114,113

LASER AND ITS METHOD OF OPERATION

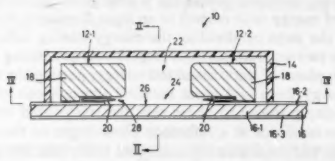
Victor Haim Hasson, and Hubertus Michael von Bergmann, both of Pretoria, South Africa, assignors to The South African Inventions Development Corporation, South Africa

Filed Jun. 2, 1976, Ser. No. 692,085

Claims priority, application South Africa, Jun. 3, 1975, 75/3563

Int. Cl.[2] H01S *3/00*

U.S. Cl. 331—94.5 G **24 Claims**



1. In a transversely excited gas laser which includes two main discharge electrodes that are rounded to generate a quasi-uniform electric field such that a lasing glow discharge occurs between them and are spaced apart to define between them a lasing gap; two trigger discharge electrodes, at least one of which is sharpened so that a corona discharge occurs between the two trigger discharge electrodes, the trigger discharge electrodes being in close proximity to the lasing gap and being spaced apart to define a trigger discharge gap; a means for immersing the main discharge electrodes and the trigger discharge electrodes in a gas; and connecting means for electrically connecting the main discharge electrodes and the trigger discharge electrodes to a high voltage pulse generating means; the improvements comprising:

each of the two trigger electrodes being directly electrically connected to a different one of the main discharge electrodes;

the breakdown voltage of the trigger electrodes being less than that of the main electrodes; and

the impedance between the trigger electrodes when a trigger corona discharge occurs between them being greater than the impedance between the main electrodes when a lasing glow discharge occurs between the said main discharge electrodes.

4,114,114

APPARATUS AND METHOD FOR INITIATING ELECTRICAL DISCHARGE IN A LASER

Robert J. Pressley, Cupertino, and Theodore S. Fahlen, San Jose, both of Calif., assignors to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Mar. 3, 1977, Ser. No. 773,826

Int. Cl.[2] H01S *3/097*

U.S. Cl. 331—94.5 PE **7 Claims**

1. High power gas transport laser apparatus comprising

a pair of juxtaposed sections, each section comprising

a channel defined by top and bottom walls and side walls,

a gas mixture comprising carbon dioxide in said channel,

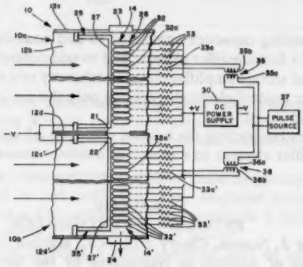
means for moving said gas mixture in one direction through said channel,

electrodes for producing an electric discharge in said gas mixture transversely of the direction of gas flow comprising

a tubular cathode between said top and bottom walls and extending in a second direction transversely of said one direction, and

an anode coextensive with said cathode and comprising a plurality of electrically conductive pads electrically insulated from each other and arranged in a row extending in said second direction, said anode being vertically spaced from said cathode and defining therebetween a discharge zone,

said sections being disposed with a side wall of one channel adjacent to a side wall of the other with the other side



walls remotely spaced apart, said rows of anode pads being in alignment,

said adjacent side walls having optical windows therein aligned with each other and with the discharge zone in each of said channels,

an optical resonant cavity comprising mirrors adjacent to said other side walls, respectively, and optically aligned with each other and with said windows for reflecting a beam of coherent light therebetween and through the windows,

a source of DC voltage connected across said anodes and cathodes, and

means for applying at least one pulse of energy simultaneously to one of said electrodes in each section while the cathode and anodes are biased by said DC source whereby to initiate said discharge simultaneously in both channels.

4,114,115

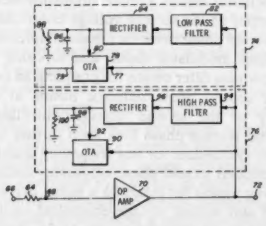
COMPANDOR APPARATUS

Thomas R. Minnis, Mountain View, Calif., assignor to California Microwave, Inc., Sunnyvale, Calif.

Filed Nov. 4, 1976, Ser. No. 738,835

Int. Cl.[2] H04B *1/64*

U.S. Cl. 333—14 **18 Claims**



1. Compandor apparatus comprising:

a signal transmission medium having a particular dynamic range;

compressor means coupled to one end of said medium for compressing the dynamic range of an input signal to be transmitted over said medium and including,

first gain control means for generating a first gain control signal proportional to the amplitude of said input signal over a first band of input signal frequencies, said first gain control signal having a first time constant,

second gain control means for generating a second gain control signal proportional to the amplitude of said input signal over a second band of input signal frequencies, said second gain control signal having a second time constant different than said first time constant, and

first amplifier means responsive to said first and second gain control signals and operative to compress the dynamic range of said input signal in accordance therewith to develop a compressed signal; and

expandor means coupled to the other end of said medium for expanding the dynamic range of said compressed signal and including,

third gain control means for receiving said compressed signal and for generating a third gain control signal proportional to the amplitude of said compressed signal over said first band of input signal frequencies, said third gain control signal having a third time constant substantially that of said first time constant,

fourth gain control means for receiving said compressed signal and for generating a fourth gain control signal proportional to the amplitude of said compressed signal over said second band of input signal frequencies, said fourth gain control signal having a fourth time constant substantially that of said second time constant,

second amplifier means responsive to said third and fourth gain control signals and operative to expand the dynamic range of said compressed signal to substantially that of said input signal.

4,114,116

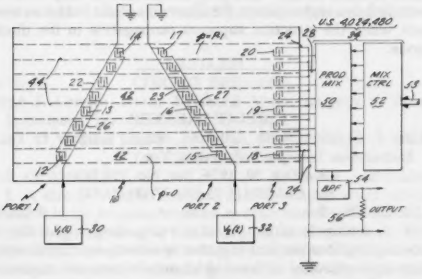
TWO-DIMENSIONAL SURFACE ACOUSTIC WAVE SIGNAL PROCESSOR

Thomas M. Reeder, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 1, 1977, Ser. No. 820,474

Int. Cl.[2] H03H *9/26, 9/30, 9/32;* H01L *41/10*

U.S. Cl. 333—30 R **5 Claims**



1. A surface acoustic wave signal processing module comprising:

a piezoelectric substrate having major surface; and

metallization on said major surface disposed to provide a plurality of acoustoelectrical transducers on the surface of said substrate, each of said acoustoelectric transducers being disposd in a corresponding one of a plurality of lines parallel with the preferred direction of propagation of said substrate, the transducers in each of said lines forming a related one of a corresponding plurality of processing channels, each of said channels having at least three transducers therein, said transducers also disposed in groups to provide processing ports, each port consisting of one transducer in each of the channels, the transducers of at least one of the ports being electrically independent of each other and the transducers of at least one of the ports being electrically interconnected in common with each other, the spacing of the transducers of a first one of the ports with respect to a second one of the ports being different from the spacing of the transducers of said first port with respect to a third one of the ports, each of said transducers oriented for coupling with waves traveling parallel to said preferred direction.

4,114,117

TUNABLE ELECTRICAL FILTER NETWORK

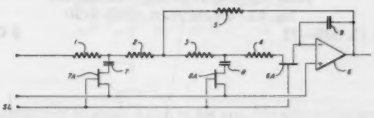
Michael Alan Ford, 7 Islet Park House, Islet Park, Maidenhead, Buckinghamshire, England

Filed Dec. 27, 1976, Ser. No. 754,643

Claims priority, application United Kingdom, Jan. 7, 1976, 00427/76

Int. Cl.[2] H03H *7/10*

U.S. Cl. 333—70 CR **10 Claims**



1. In a tunable electrical filter the combination of:

a. an RC network for determining the smallest value of time constant and therefore the narrowest bandwidth of the filter, said network comprising a plurality of capacitors;

b. a plurality of electronic switching means each having input means and output means, the output means of a given switching means being connected to a given capacitor to control the switching thereof in and out of the network; and

c. means for varying the ON-time to OFF-time ratio of a train of output pulses connected to the input of each switching means for providing a switching waveform thereat, whereby in operation the time constant of the filter may be varied from said smallest value upwards within a predetermined range by simultaneously switching all the capacitors in and out of the network at a selected ON-time to OFF-time ratio.

4,114,118

ELECTROMECHANICAL FILTER HAVING ENCAPSULATED INPUT AND TERMINAL CIRCUIT CAPACITORS

Güenter Krauss, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 15, 1976, Ser. No. 741,848

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553709

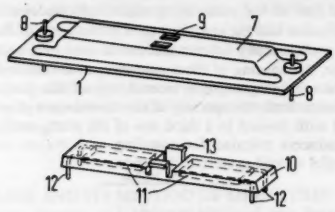
Int. Cl.[2] H03H *7/10, 7/30*

U.S. Cl. 333—71 **10 Claims**

1. In an electromechanical filter of the type having a metallic base plate, a plurality of mechanically coupled mechanical resonators disposed parallel to each other on the base plate, a pair of electrostrictive transducer elements each associated with a respective end mechanical resonator of the plurality of resonators and having a feeder which is constituted by an insulating bushing disposed on the base plate and a terminal extending through the insulator and connected to a respective electric LC input or output circuit each of which includes a respective capacitor, the improvement therein wherein:

said metallic base plate includes a trough-shaped recess in the area below the resonators; and

said capacitors are jointly encapsulated with insulation material into a capacitor unit, said capacitor unit shaped to



conform to the shape of the recess in the metallic base plate and form-locked mounted therein.

4,114,119

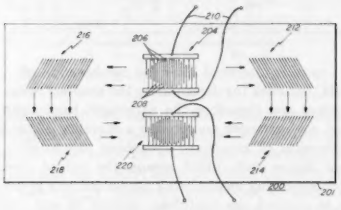
WIDE BAND LOW LOSS ACOUSTIC WAVE DEVICE

Frank Sandy, Lexington, and Manfred B. Schulz, Sudbury, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 24, 1976, Ser. No. 689,398

Int. Cl.[2] H03H *9/26, 9/02, 9/30*

U.S. Cl. 333—72 **8 Claims**



1. In combination:

means for supporting surface acoustic waves;

input transducer means coupled to said surface acoustic wave supporting means for producing surface acoustic waves in a plurality of directions;

output transducer means coupled to said surface acoustic wave supporting means, said output transducer means being positioned non-colinearly from said input transducer; and

a plurality of reflecting gratings for directing the surface acoustic waves produced at said input transducer means within a predetermined range of frequencies to said output transducer means, each of said reflecting gratings comprising a plurality of substantially parallel grooves, the width of said grooves being determined in accordance with predetermined frequency characteristics.

4,114,120

STRIPLINE CAPACITOR

David A. Lupfer, Metuchen, N.J., assignor to Dielectric Laboratories, Inc., Cazenovia, N.Y.

Filed Nov. 23, 1976, Ser. No. 744,237

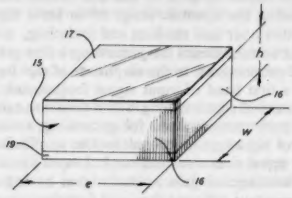
Int. Cl.[2] H01P *3/00;* **H01G** *1/005, 1/14*

U.S. Cl. 333—84 M **21 Claims**

1. In a stripline circuit having a stripline of width *w*, an improved capacitor comprising:

a. a plane parallel dielectric body having upper and lower faces, the width of said dielectric being at least approximately equal to said width *w* of said stripline;

b. a first electrode on the lower face of said dielectric, said electrode completely covering said face and thus also having said width *w*; and



c. a similar second electrode on the upper surface of said dielectric.

4,114,121

APPARATUS AND METHODS FOR LAUNCHING AND SCREENING ELECTROMAGNETIC WAVES IN THE DIPOLE MODE

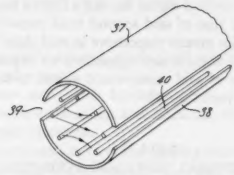
Harold Everard Monteagle Barlow, Epsom, England, assignor to National Research Development Corporation, London, England

Filed Dec. 30, 1976, Ser. No. 755,844

Claims priority, application United Kingdom, Jan. 16, 1976, 01736/76

Int. Cl.[2] H01P *1/16, 3/00*

U.S. Cl. 333—95 R **26 Claims**



1. Electromagnetic wave apparatus including a structure capable of supporting electromagnetic waves in the dipole mode, the structure being generally circular in cross section and comprising spaced apart conductors elongated in the general direction of propagation, and a screen of conducting material at least partially enclosing the said structure and positioned outside it in a region where the electromagnetic field is evanescent when the structure supports propagation in the dipole mode.

4,114,122

CIRCUIT BREAKER

Aime J. Grenier, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

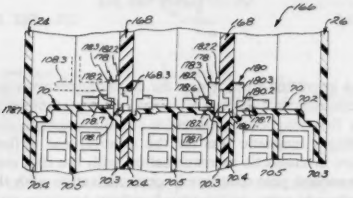
Filed Dec. 30, 1976, Ser. No. 755,763

Int. Cl.[2] H01H *75/00, 77/00, 83/00*

U.S. Cl. 335—8 **9 Claims**

1. A multipole circuit breaker comprising a plurality of housing sections secured together in side-by-side relation for forming a plurality of housing chambers between respective pairs of the sections; and, in each chamber, fixed contact means, movable contact means movable between a position engaging the fixed contact means for closing a circuit and a position spaced from the fixed contact means for opening said circuit, means biasing the movable contact means to said open circuit position, an operating handle extending from the chamber to be manually moved between corresponding open and closed circuit positions, linkage means connecting the operating handle to the movable contact means, said linkage means having a tripping member pivotally movable thereon between a first position permitting the movable contact means to be

moved between said open and closed circuit positions in response to manual movement of the operating handle and a second position permitting the movable contact means to move to said open circuit position in response to said biasing means independently of the position of the operating handle, means responsive to conditions in the breaker circuit for moving the tripping member to said second position on the occurrence of selected conditions in said circuit, and at least one multipole actuator member having a cam portion thereon, said actuator member being pivotally mounted on a housing section for movement between a first and a second position, said actuator member having said cam portion disposed to be engaged when in in said first position of the actuator member by movement of said movable contact means to said open circuit position for moving the actuator member to said second position thereof, said actuator member having said cam portion disposed to engage and move the tripping member from its first position to its second position when said actuator member is moved into



said second position of the actuator member; said circuit breaker having openings in the housing sections extending between each pair of adjacent housing chambers, said circuit breaker having pairs of said multipole actuators in respective adjacent housing chambers each having a splined shaft extending into one of said openings and secured in splined engagement with corresponding shaft portion of the other actuator member of said pair in the adjacent housing chamber for mounting the actuator member for said pivotal movement and for connecting the members together for common movement with each other; whereby movement of the movable contact means in one housing chamber to open circuit position on the occurrence of said selected circuit conditions initiates pivotal movement of at least one pair of said multipole actuator members to said second positions of the members for moving the tripping member in an adjacent housing chamber to open the circuit in said adjacent housing chamber as said actuator members are moved into said second positions of the members.

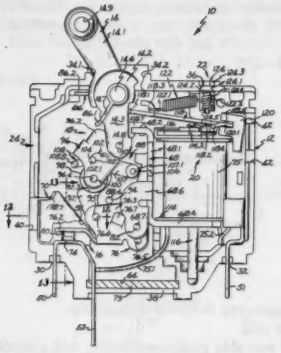
4,114,123

CIRCUIT BREAKER

Aimé J. Grenier, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1976, Ser. No. 755,516
Int. Cl.² H01H 71/74
U.S. Cl. 335—42 **13 Claims**

1. A circuit breaker comprising a housing, contact means movable in the housing between an open circuit position and a closed circuit position, means biasing the contact means to said open circuit position, operating means extending from the housing to be manually movable between corresponding open and closed circuit positions, linkage means connecting the operating means to the contact means for moving the contact means between said open and closed circuit positions in response to manual movement of the operating means, said linkage means being adapted to be tripped for permitting the contact means to move to said open circuit position in response to said biasing means independently of the position of the operating means, an arm, pivot means mounting the arm for movement from a rest position to an actuating position for tripping the linkage means, means responsive to conditions in the breaker circuit applying a bias to the arm for moving the arm to its actuating position with a force proportional to conditions in the circuit, a calibrating member mounted on the housing for free rotation around the longitudinal axis of the member, the calibrating member having threaded portion rotatable therewith extending into the housing, and tension spring means having one end connected to the arm and having its opposite end connected to the threaded portion of the calibrating member so that the longitudinal axis of the spring means extends generally perpendicular to the longitudinal axis



of said member to apply a bias to the arm in a selected direction with a selected moment arm relative to said pivot means for holding the arm in its rest position with a selected counterforce, the tension spring means having said opposite end threadedly engaged with the threaded portion of the calibrating member to be advanced along the axis of said threaded portion in response to rotation of the calibrating member to vary the direction and moment arm with which the spring means applies its bias to the arm for varying said counterforce to calibrate the circuit breaker.

4,114,124

CONVERGENCE APPARATUS WITH VARIABLY MAGNETIZED MAGNETS

Masayoshi Aya, Ibaraki, and Kohji Hiya, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 21, 1977, Ser. No. 808,567
Claims priority, application Japan, Jun. 25, 1976, 51-75690
Int. Cl.² H01F 7/00
U.S. Cl. 335—212 **1 Claim**

1. A convergence apparatus comprising a pair of four-pole static magnets and a pair of six-pole static magnets mounted rotatably at a neck portion of an inline color CRT having three electron guns arranged in horizontal line laterally in a single line, said pairs of static magnets being arranged in the axial direction of the neck portion, wherein a magnetization density of N poles and that of S poles of at least one of said pair of four-pole static magnets and said pair of six-pole static magnets are made to be different from each other, and in the pair of static magnets of which the magnetization density of N poles

and that of S poles are made to be different from each other the magnetization density of a static magnet which lies closer to an electron beam exit of said CRT is made to be larger than the magnetization density of the other static magnet.

4,114,125

PLUNGER TYPE SOLENOID

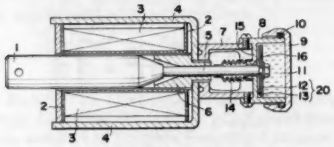
Saburo Komatsu, Odawara, Japan, assignor to O.P.O. Giken Kabushiki Kaisha, Japan

Filed Aug. 17, 1976, Ser. No. 715,193

Claims priority, application Japan, Aug. 18, 1975, 50-099961; Nov. 29, 1975, 50-142639; Dec. 8, 1975, 50-146119

Int. Cl.² H01F *7/08*

U.S. Cl. 335—258 **11 Claims**



1. A plunger-type solenoid comprising:

a solenoid coil;

a plunger movably positioned within said solenoid coil, said plunger being movable in a first direction toward a first end of said solenoid upon energization of said solenoid coil, and said plunger being movable in a second direction opposite said first direction toward a second end of said solenoid coil upon deenergization of said solenoid coil;

a cylinder fixedly positioned with respect to said solenoid coil adjacent said first end thereof, said cylinder having therein a chamber containing a damping liquid;

a shaft having a first end connected to said plunger and a second end;

a piston fixedly connected to said second end of said shaft, such that said piston moves within said chamber during movement of said plunger in said first and second directions;

said piston having an outer peripheral edge which is separated from the internal surface of said chamber, thus forming an annular space therebetween, such that during movement of said piston within said chamber liquid is forced through said space in quantities inversely proportional to the degree of resistance to movement of said piston and plunger in said first and second directions; and

said piston comprising a first substantially planar disc-shaped element formed of a rigid and inflexible material, said first disc-shaped element having a first diameter, and a second substantially planar disc-shaped element formed of a flexible material in abutting contact with said first disc-shaped element, said second disc-shaped element having a second diameter greater than said first diameter, and said first disc-shaped element being positioned closer to said plunger than is said second disc-shaped element, such that upon movement of said plunger in said first direction, said second disc-shaped element is maintained in substantially planar configuration in abutment with said first disc-shaped element, and said space is defined by said second diameter, and such that upon movement of said plunger in said second direction, said second disc-shaped element is deformed by said liquid in a manner such that said annular space is enlarged and is defined by said first diameter, thereby allowing an increased flow of said liquid through said annular space and reducing the resistance to movement of said piston and said plunger in said second direction.

4,114,126

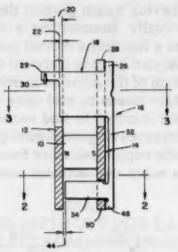
SYSTEM FOR MOUNTING AN ARMATURE

David G. Geis, Chicago, and Ingard B. Hodne, Northbrook, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Jul. 18, 1977, Ser. No. 816,823

Int. Cl.² H01F *7/08*

U.S. Cl. 335—270 **9 Claims**



1. An improved arrangement for mounting an armature on a magnetic structure having a source of magnetomotive force with a first magnetic pole and a second magnetic pole for providing a magnetic bias for the arrangement, a first pole structure in magnetic communication with the first magnetic pole, a second pole structure in communication with the second magnetic pole, an improved unitary armature structure including an armature spring and means for biasing the armature spring, wherein the improvement comprises:

a partial overlap of the armature and the first pole structure for producing a magnetic tensile force on the armature tending to pull the armature toward the first pole structure;

a first stop limiting movement of the armature toward the first pole structure;

a magnetic gap on the armature spring biasing means, the gap producing a magnetic tensile force tending to rotate the armature with respect to the pole structures; and

a second stop limiting rotation of the armature against the magnetic tensile force acting on the armature spring biasing means.

4,114,127

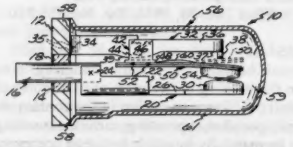
CURRENT INTERRUPTING APPARATUS

Radi Pejouhy, Marshfield, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 30, 1976, Ser. No. 728,350

Int. Cl.² H01H *61/00*

U.S. Cl. 337—97 **3 Claims**



1. Current interrupting apparatus comprising a housing having an open end, a thermostatic member mounted in the housing, the thermostatic member adapted for movement between first and second positions, movable and stationary contact means mounted within the housing, the movable contact operatively connected to the thermostatic member so that the contacts will be in engagement when the thermostatic member is in the first position and will be out of engagement

when the thermostatic member is in the second position, electrical terminals electrically connected to the respective movable and stationary contact means, and an electrically insulative header closing the open end of the housing and maintaining the terminals electrically separated from one another and an atmosphere within the housing essentially consisting of a mixture of argon and helium in which the mixture consists of from 80–95 parts argon and 20–5 parts helium.

4,114,128

COMPOSITE SECTIONALIZED PROTECTIVE INDICATING-TYPE FUSE

Frank L. Cameron, Irwin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 519,362, Oct. 30, 1974, abandoned, which is a continuation of Ser. No. 67,175, Aug. 26, 1970, abandoned. This application Oct. 10, 1975, Ser. No. 622,279

Int. Cl.[2] H01H *71/20*

U.S. Cl. 337—162 **8 Claims**

1. A composite dual-acting protective fuse comprising, in combination, means defining a high-current current-limiting completely-enclosed interrupting fuse section and a mechanically-connected low-current expulsion-type interrupting fuse section, said low-current expulsion-type interruptng fuse section including a pull-away indicating fuse-link cable which is completely pulled out of said low-current expulsion-type fuse-section following all fuse operations, whereby on low-current interruption, the low-current expulsion-type interrupting fuse section only need be replaced in a refusing operation and both the high-current and low-current fuse sections fusing simultaneously on high-current interruptions.

4,114,129

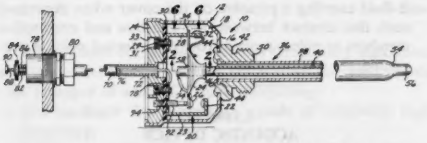
THERMALLY RESPONSIVE ACTUATOR

Bruce B. Parsons, Tokyo, Japan, and Denis G. Wolfe, Santa Ana, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 10, 1977, Ser. No. 758,036

Int. Cl.[2] H01H *37/48*

U.S. Cl. 337—387 **12 Claims**



1. A thermally responsive actuator comprising:

a housing;

switch means received within said housing including stationary contact means and a switch blade movable within said housing and carrying movable contact means into and out of engagement with said stationary contact means;

temperature responsive means including first and second coextensive members of dissimilar metals exhibiting a thermoelectric effect and having different coefficients of thermal expansion, one of said members fixedly secured to said housing and distally secured to other of said members, the latter being movably received within said housing;

coupling means within said housing linking the received end of said other member in mechanical coupling to said switch blade and in electrical coupling to said movable contact means; and

first and second output conductor means extending, respectively, to electrical contact with said fixed contact and with said first member.

4,114,130

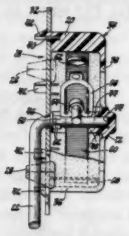
FUEL LEVEL SENDER WITH MOLDED PLASTIC CASE

Stephen J. Sutton, Fenton; J. Robert Holen, Flushing, and John E. Creager, Fenton, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1977, Ser. No. 854,711

Int. Cl.[2] H01L *10/14*

U.S. Cl. 338—33 **1 Claim**



1. A fuel level sender having a float arm pivoted to a housing, the housing comprising a conductive plate and a molded plastic case secured to the conductive plate, a potentiometer within the housing including a wiper element connected to the float arm for movement therewith, a contact member on the float arm adjacent the conductive plate electrically connected with the wiper element, the case including an integrally molded resilient finger having a free end biased toward the conductive plate, a sleeve member integrally formed on the free end of said resilient finger, the said float arm being journalled in the sleeve member so that the contact member on the float arm is urged by the resilient finger into secure electrical contact with the conductive plate thereby electrically connecting the wiper element of the potentiometer with the conductive plate.

4,114,131

VARIABLE RESISTOR

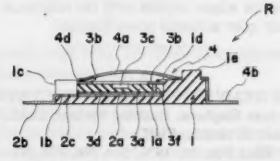
Yoshiyuki Nakatsu, Osaka, and Hideo Nishizawa, Nagaokakyo, both of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Feb. 14, 1977, Ser. No. 768,618

Claims priority, application Japan, Mar. 2, 1976, 51-22750

Int. Cl.[2] H01C *10/30*

U.S. Cl. 338—162 **20 Claims**



1. A variable resistor for use in electrical and electronic equipment which comprises a base plate member of electrically insulating material, at least one first stator terminal member incorporated in one surface of said base plate member, a rotor member of electrically insulating material having electrically conductive film means on one surface thereof and electrically

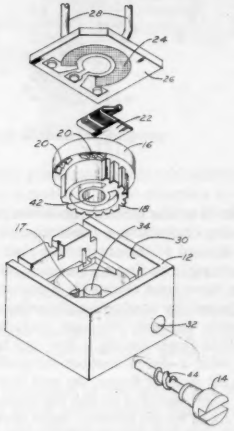
resistant film means on the other surface thereof, said rotor member being rotatably disposed on said first stator terminal member with said conductive film means contacting said first stator terminal member for sliding movement thereon, a second stator terminal member secured to said base plate member for sliding contact with said resistant film means of said rotor member, said resistant film means of said rotor member being electrically connected with said conductive film means of said rotor member.

4,114,132

WORM GEAR POTENTIOMETER RATCHET SYSTEM

Joseph Rodolph DeRouen, Banning, and Lawrence Kucharski, Jr., Sunnymead, both of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed May 25, 1977, Ser. No. 800,600
Int. Cl.² H01C *10/34*
U.S. Cl. 338—174 **11 Claims**



1. A worm gear actuated potentiometer mounted in a housing comprising:
- a rotatable worm screw having threads and mounted so as to be adjustable without limit in clockwise and counterclockwise directions from outside the housing of the variable potentiometer;
- a rotor having spur gear teeth on less than 360° of its circumference in drivable engagement with said worm screw;
- rack gear teeth mounted to a portion of the circumference of said rotor not occupied by said spur gear teeth;
- stop means to limit the rotation of said rotor to less than 360°; and
- wiper contact spring means for urging the rack gear teeth into engagement with the worm screw and for maintaining collector wiper contact with the resistance element of the worm gear actuated potentiometer.

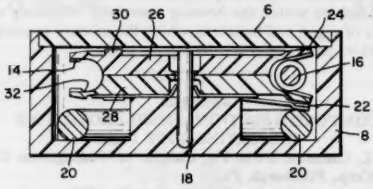
4,114,133

WORM GEAR DRIVE AND RATCHET SYSTEM

Donald Harrison Stephens, Running Springs, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Feb. 16, 1978, Ser. No. 878,191
Int. Cl.² H01C *10/34*
U.S. Cl. 338—174 **10 Claims**

1. A worm gear drive and ratchet system mounted in a housing and having a two-piece, toothed drive wheel comprising:
- identical top and bottom gear halves having at least two locator holes and a center hole in each gear half;
- at least two locator pegs on each of said top gear half and said bottom gear half to be received into said locator holes;
- gear teeth molded into each of said top gear half and said bottom gear half; and



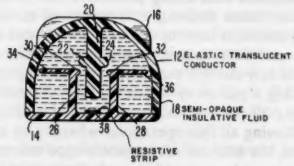
- a mechanical stop molded onto said identical top and bottom gear halves.

4,114,134

POTENTIOMETER

Victor B. Kley, 2211 Byron St., Berkeley, Calif. 94702

Filed Sep. 1, 1976, Ser. No. 719,407
Int. Cl.² H01C *1/02*
U.S. Cl. 338—231 **13 Claims**



1. A potentiometer comprising
- a base member,
- a flexible cover attached to the base member so as to form a closed receptacle therebetween,
- an insulating fluid filling the receptacle,
- a resistive member attached to one of the base member and the top cover, and
- a conductive member attached to the other of the base member and top cover, so that the conductive member and the resistive member touch when the top cover is depressed at a selected point determining the value of resistance thus connected to the conductive member,
- said fluid exerting a pressure on the cover when depressed such that contact between the resistive and conductive members at points spaced from the selected point is prevented.

4,114,135

ACOUSTIC DEVICE

Clarence J. Funk, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 20, 1975, Ser. No. 589,658
Int. Cl.² H04B *11/00*
U.S. Cl. 340—2 **9 Claims**

1. A system for self monitoring of air-water borne noise from an aircraft comprising:
- An acoustic monitoring buoy including;
  - pendent means attached to said acoustic monitoring buoy and extending downwardly therefrom,
  - a plurality of electroacoustic transducers attached to said pendent means to form a phased array to detect predetermined artifact frequencies originating from said aircraft and transmitted through the water,

communication means effectively connected to said plurality of electroacoustic transducers for transmitting said detected artifact frequencies to said aircraft, and

positioning means attached to said acoustic monitoring buoy for indicating to the aircraft the location of said acoustic monitoring buoy; and

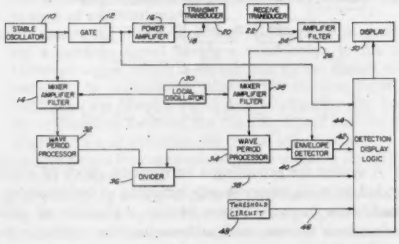
a plurality of acoustic pinger buoys positioned about and spaced from said acoustic monitoring buoy each having a positioning means similar to that positioning means on said acoustic monitoring buoy for indicating to the aircraft the location of the individual pinger buoy to which it is attached.

4,114,136

DETERMINATION OF VARIATIONS OF WAVE CHARACTERISTICS

John M. D'Albora, Tiverton, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1975, Ser. No. 446,571
Int. Cl.[2] G01S 9/66
U.S. Cl. 340—3 R **10 Claims**



1. A processor for measurement of statistically significant variations of the time period of a volume reverberated signals in the presence of noise in a fluid, comprising:

a first oscillator for generating signals of relatively high frequency;

a gating means for gating the output of said first oscillator;

a first amplifying means for amplifying the gated output of said first oscillator;

a transmit transducer for transmitting the output of said first amplifying means as transmitted signals for volume reverberation in said fluid;

a receive transducer for receiving said transmitted signals after being volume reverberated in said fluid;

an amplifying and filtering means for amplifying and filtering the output of said receive transducer;

a second oscillator for generating signals of slightly lower frequency than the frequency of the output of said first oscillator;

a first mixing, amplifying and filtering means for heterodyning the outputs of said first oscillator and said second oscillator;

a second mixing, amplifying and filtering means for heterodyning the outputs of said amplifying and filtering means and said second oscillator;

a first wave period processor for measuring the time period of the output of said first mixing, amplifying and filtering means and thus the time period of the output signals of said first oscillator;

a second wave period processor for measuring the time period of the output of said second mixing, amplifying and filtering means and thus the time period of the received signals;

a dividing means for comparing the outputs of said first and second time period processors;

an envelope detector for measuring the amplitude of the received volume reverberated signals, said envelope detector producing an output upon coincidence of the output of second mixing, amplifying and filtering means and the output of second wave period processor, thus measuring the amplitude and the time period of the same received volume reverberated signal;

a detection display logic means for sorting out the outputs of said envelope detector and said dividing means while the gated output of said first oscillator providing time base reference for said detection display logic means; and

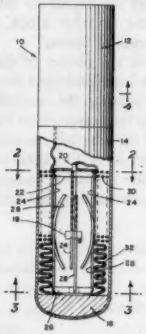
a display means for displaying the time period variation information and amplitude variation information of said received volume reverberated signals.

4,114,137

DIRECTIONAL SONOBUOY

Russell I. Mason, Doylestown, and John R. Dale, Willow Grove, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 19, 1974, Ser. No. 535,332
Int. Cl.[2] G01V 1/00
U.S. Cl. 340—85 **2 Claims**



1. A deployable high drag, low noise hydrophone assembly, in combination, comprising:

a hydro-acoustic transducer formed to be electrically connected to a signal processor;

a non-porous inflatable globular bag transparent to acoustic energy secured to and centrally enclosing said transducer;

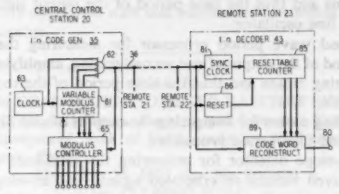
spreading means opposingly connected to the upper and lower portions of said bag for urging said bag into the globular configuration; and

filling means having a flapper valve operatively connected to the lower portion of said bag and responsive to the oscillatory motion thereof for filling said bag with water upon deployment.

4,114,138
SELECTIVE CALLING CIRCUIT

Robert Augustus Demers, Marlboro, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 23, 1976, Ser. No. 716,581
Int. Cl.[2] H04Q *9/00*
U.S. Cl. 340—147 R **6 Claims**



1. An asynchronous telemetry circuit comprising a 1-out-of-*n* (1:*n*) digital code generator including

a generator clock,

a variable modulus counter connected to the generator clock and arranged for counting in response to signals from the generator clock,

means connected to the variable modulus counter for varying the modulus of the variable modulus counter,

means connected to the variable modulus counter and to the generator clock and responsive to the states of the variable modulus counter and to signals from the generator clock for producing at an output of the code generator a repetitious stream of 1:*n* digital code word signals, wherein each different code word includes a different number of bits *n;*

means connected to the output of the code generator for transmitting the digital code word signals from the generator to a 1:*n* decoder; and

the 1:*n* decoder including

a decoder clock connected to an output of the transmitting means for producing decoder clock signals synchronized with received digital code words,

a resettable counter connected to the decoder clock and responsive to the decoder clock signals for stepping through predetermined states,

means connected to the output of the transmitting means responsive to the 1:*n* digital code word signals for producing a signal for resetting the resettable counter, and

means connected to the output of the transmitting means and to the output of the resettable counter and responsive to the repetitious stream of 1:*n* digital code word signals and to the state of the resettable counter for reconstructing predetermined individual digital code words.

4,114,139
SECURITY CONTROLLED INFORMATION EXCHANGE SYSTEM

William Weller Boyd; Robert Joseph Grafe, and Carl Oscar Pingry, III, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

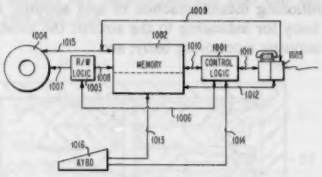
Filed Jan. 25, 1977, Ser. No. 762,376
Int. Cl.[2] H04Q *9/00*
U.S. Cl. 340—147 R **13 Claims**

1. A method of communicating data between terminals in a system in a selective manner comprising the steps of:

assigning an LUID to each user in said system,

transmitting the LUID of a calling user to a called terminal, and

comparing the LUID of the calling user with an RUID of the called user at the called terminal and if a compare is

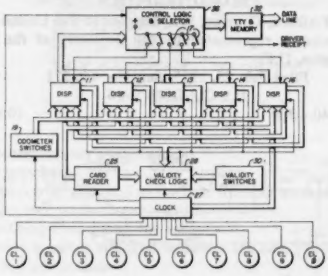


made by the control logic of the terminal, transmitting the LUID of the called user to the calling terminal.

4,114,140
VERIFICATION CHECKING SYSTEM

John Kubina, San Francisco, Calif., assignor to Engineered Systems, Inc., Tempe, Ariz.

Filed Apr. 25, 1977, Ser. No. 789,960
Int. Cl.[2] G06K *5/00;* H04Q *3/02*
U.S. Cl. 340—149 A **8 Claims**



1. A system for providing a verification check of uniquely encoded multi-bit binary words including in combination:

read/write memory means having a plurality of address locations therein, each address location storing a single binary bit;

address control means operated in response to addressing signals and coupled to said memory means for selecting a particular address location in said memory means for writing data into and reading data from said particular address location;

read/write control means coupled to said memory means for controlling the mode of operation of said memory means;

gating circuit means having a plurality of inputs and having outputs coupled with said address control means for supplying said addressing signals thereto;

settable switch means coupled to selected inputs of said gating circuit means for supplying input signals thereto;

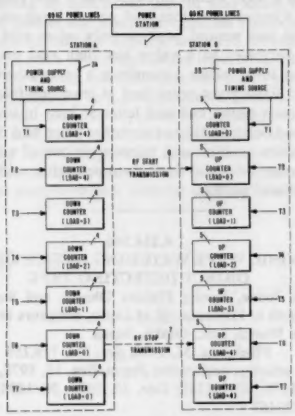
circuit means coupled to others of the inputs of said gating circuit means for supplying input signals thereto; and

selecting means coupled to said gating circuit means for causing the signals appearing on the outputs of said gating circuit means to be selected from the input signals from said settable switch means or the input signals from said circuit means.

4,114,141
DIGITAL COMMUNICATION SYSTEM FOR TRANSMITTING DIGITAL INFORMATION BETWEEN A CENTRAL STATION AND A NUMBER OF REMOTE STATIONS

Brian A. Travis, Sea Bright, N.J., assignor to Datrix Corporation, Westchester, N.Y.

Filed Jan. 14, 1977, Ser. No. 759,774
Int. Cl.² H04M *11/04*
U.S. Cl. 340—151 **62 Claims**



1. A communication system having at least two stations for communicating digital information between said stations comprising:

a signal source coupled to all said stations;

reference means connected to said signal source in each of said stations for generating the same time reference signal in each of said stations;

signal generating means in each of said stations for generating a marking signal having a relationship to the time reference signal which is determined by the digital information to be transmitted, wherein the marking signal by itself does not contain the digital information but rather the relationship between the marking signal and the time reference signal identifies the digital information;

signalling means for communicating the marking signal from station to station; and

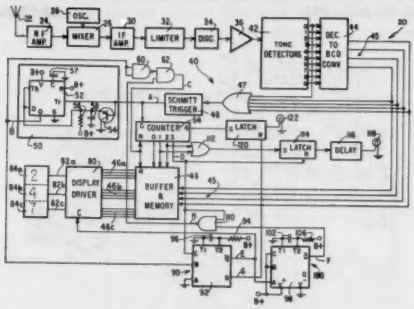
signal evaluating means in each of said stations for evaluating the relationship between the marking signal communicated from another one of said stations and the time reference signal generated in said station to determine the digital information transmitted from said another one of said stations.

4,114,142
DECODER OPERABLE ONLY ON RECEPTION OF PREDETERMINED NUMBER OF WORDS

Keith H. Wycoff, 1205 N. Tyler St., Lexington, Nebr. 68850, and William H. Dittmer, Lexington, Nebr., assignors to Keith H. Wycoff, Lexington, Nebr.

Filed Jul. 24, 1975, Ser. No. 598,587
Int. Cl.² H04Q *5/00*
U.S. Cl. 340—164 R **7 Claims**

1. A decoder responsive to a code consisting of a predetermined number of words having no start and stop components, each of said words lasting for at least a predetermined duration, said decoder comprising memory means having a signal input coupled to receive the words and being operative to store signals corresponding to the words, counting means for simultaneously counting the number of words, circuit means coupled to said counting means and being responsive to the lack of a word in the predetermined duration immediately following said predetermined number of words to produce a release signal, and utilization means coupled to said memory means and to said circuit means and being operative to provide

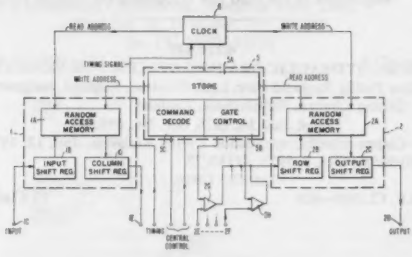


output information from said memory means corresponding to the code only upon receipt of the release signal, whereby said decoder produces output information only upon receipt of exactly the predetermined number of words.

4,114,143
MODULAR SWITCHING SYSTEM

Maurice Karnaugh, Scarborough, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 12, 1977, Ser. No. 796,296
Int. Cl.² H04Q *3/54*; H04M *11/00*
U.S. Cl. 340—166 R **10 Claims**



1. In a digital switch of the type wherein time division multiplexed information arriving at one of a plurality of inputs is switched through an interconnecting matrix of rows and columns of conductors to one of a plurality of outputs, the improvement comprising:

a conductor matrix part, and

positioned thereon a single part type for each said row conductor of said interconnecting matrix,

said single part type comprising:

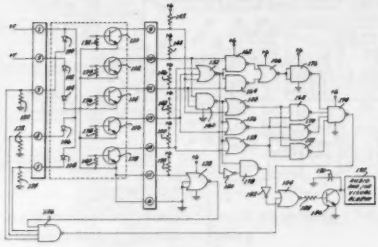
an input terminal connected to an input buffer, communication capability with one column of said conductor matrix part,

an output terminal connected to an output buffer, and means providing gated communication with all columns of said conductor matrix part and control means associated with said input buffer, said output buffer and said gated communication means to transfer information from one said input terminal to one said output terminal at a specified time.

4,114,144
AUTOMATIC AIR-IN-LINE FLUID DETECTOR

Oscar E. Hyman, Encinitas, Calif., assignor to Imed Corporation, San Diego, Calif.

Filed Aug. 12, 1976, Ser. No. 713,664
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—632 23 Claims



9. An automatic air-in-line fluid detector for detecting air-in-line fluid detector for detecting the presence of air-in-line for a fluid line containing either a transparent or an opaque fluid, including

first means operatively coupled to the fluid line for detecting air-in-line with the fluid line containing the transparent fluid,

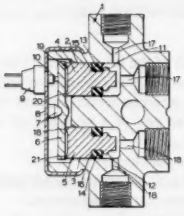
second means operatively coupled to the fluid line for detecting air-in-line with the fluid line containing the opaque fluid, and

third means operatively coupled to the first and second means and responsive to the fluid line containing the transparent fluid or the opaque fluid and with the first means detecting air-in-line in the fluid line containing the transparent fluid when the third means is responsive to the fluid line containing the transparent fluid and with the second means detecting air-in-line when the third means is responsive to the fluid line containing the opaque fluid.

4,114,145
DUAL HYDRAULIC BRAKING SYSTEM FOR VEHICLES

Glyn Phillip Reginald Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England

Filed Jun. 14, 1976, Ser. No. 695,467
Claims priority, application United Kingdom, Jun. 12, 1975, 25169/75; Oct. 7, 1975, 41110/75
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—626 17 Claims

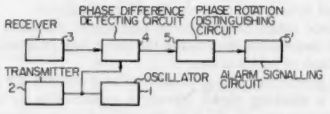


1. A pressure differential warning actuator comprising detector means for detecting when a differential between the pressures of separate brake circuits of an hydraulic braking system exceeds a predetermined value, a housing having separate bore portions and a relatively fixed pivot point therein, said detector means being positioned in said housing, said housing being also provided with ports connected to said separate brake circuits, and indicator means actuated by said detector means when said predetermined value is exceeded, said detector means comprising at least a first piston and a second piston each responsive to pressure in at least one of said brake circuits, said pistons working in respective separate bore portions of said housing, pressure from said separate brake circuits being connected through said ports to said pistons to move said pistons between a neutral position in which said indicator means is rendered inoperative when said differential pressure is less than said predetermined value, and an operative position in which said indicator means is rendered operative when said differential pressure exceeds said predetermined value, and a lever means through which said pistons act and which is adapted to restore said pistons from said operative position to said neutral position only when said differential pressure decreases to a value less than said predetermined value, said lever means comprising a lever adapted to rock about said fixed pivot point, and at least one fulcrum acting between each piston and said lever at least in said operative position and being positioned such that when said pistons are in said operative position said fulcrum on one of said pistons is spaced farther from said fixed pivot point than said fulcrum on another of said pistons.

4,114,146
ULTRASONIC WAVE WATCHING DEVICE OF MOVING OBJECT DETECTING TYPE

Hiromitsu Inoue, Kyoto; Hiroshi Ohashi, and Susumu Katayama, both of Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 31, 1976, Ser. No. 719,159
Claims priority, application Japan, Sep. 13, 1975, 50/111114; Sep. 13, 1975, 50/111115; Dec. 15, 1975, 50/149815; Feb. 28, 1976, 51/21467
Int. Cl.[2] G08B 13/24
U.S. Cl. 340—558 5 Claims



1. An ultrasonic wave watching device of moving object detecting type comprising an ultrasonic wave transmitter, a high frequency oscillator for exciting said transmitter and providing a reference signal of oscillated high frequency, a receiver for receiving reflected ultrasonic wave transmitted by the transmitter and reflected from an object to generate a received wave signal, means for detecting any difference in phase between said received wave signal from said receiver and said reference signal from the oscillator, means for distinguishing a fixed directional phase rotation of said phase difference detected by said phase difference detecting means, an alarm signalling means responsive to an output from said phase rotation distinguishing means, and a correction means responsive to an output from said phase difference detecting means for adjusting at least one of mutual relations in phase and magnitude between said received wave signal and said reference signal.

4,114,147
CODE COMBINATION PROPERTY ALARM SYSTEM

John R. Hile, 115 Mulberry St., Inman, S.C. 29349

Filed Mar. 24, 1977, Ser. No. 780,841
Int. Cl.[2] G08B 29/00
U.S. Cl. 340—528 10 Claims

1. A property protection alarm system for protecting property against unauthorized intrusion and the like comprising:

sensing means for sensing an alarm condition such as any intrusion of the property, said sensing means including

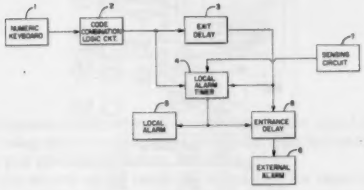
means for detecting movement through normal entrance to the property;

a local audible alarm;

an external alarm;

alarm energization means responsive to said sensing means for energizing said local audible alarm for a given alarm interval upon the occurrence of any intrusion of the property including an authorized intrusion through said normal entrance and energizing said external alarm only after a predetermined entrance delay period;

arming means connected to said alarm energization means for enabling an authorized user of said alarm system to arm and disarm said alarm energization means, said arming means including a numeric keyboard having a plurality of keys and a code combination logic circuit connected thereto for arming and disarming said alarm energization means in response to a predetermined numeric code entered in said numeric keyboard by actuation of selected ones of said keys, said code combination logic circuit including code timing means responsive to the actuation of the first of said selected ones of said keys associated with the predetermined numeric code for establishing a



predetermined code interval in which all of the remaining ones of said selected ones of said keys associated with the predetermined numeric code must be actuated in order to arm or disarm said alarm energization means;

said alarm energization means including exit delay means actuated by said arming means for delaying only the arming of said alarm energization means by said arming means for a predetermined exit delay period to permit the authorized user of said alarm system to leave the property through said normal entrance without energizing either said local audible alarm or said external alarm, said alarm energization means further including entrance delay means connected to said external alarm for delaying energization of said external alarm for the predetermined entrance delay period to permit the authorized user to enter the property through said normal entrance without energizing said external alarm and disarm said alarm system by actuating said arming means, said local audible alarm being immediately energized for a given alarm interval in response to any intrusion of the property including an authorized intrusion through said normal entrance.

4,114,148
DISPLAY PANEL WITH PHOSPHORS

Thomas C. Maloney, Bernardsville, N.J., and Rudolph A. Cola, Malvern, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed May 12, 1976, Ser. No. 685,526
Int. Cl.² H01J *17/48*
U.S. Cl. 340—343 **12 Claims**

1. A display panel comprising

a gas-filled envelope,

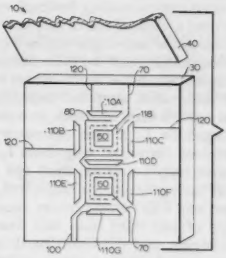
a glow cathode in said envelope,

a first anode in operative relation with said glow cathode and positioned to form a first current flow path therewith,

means for connecting said first anode and said glow cathode in said first current flow path whereby electrical potentials can be applied therebetween to cause said cathode to exhibit cathode glow,

a second anode in operative relation with said glow cathode and positioned to form a second current flow path therewith,

means for connecting said second anode and said glow cathode in said second current flow path whereby electrical potentials can be connected therebetween and current



flow can be directed preferentially between said cathode and said second anode, and

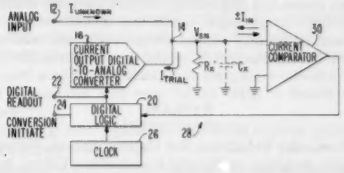
phosphor material adjacent to said second anode and generating light output when current flows between said cathode and said second anode,

said cathode, said first anode and said second anode being generally aligned along said first and second current flow paths.

4,114,149
CURRENT COMPARATOR FOR AN IMPROVED ANALOG-TO-DIGITAL CONVERTER METHOD AND APPARATUS

Larry J. Kendall, San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jul. 19, 1976, Ser. No. 706,668
Int. Cl.² H03K *13/03*
U.S. Cl. 340—347 AD **2 Claims**



1. An improved analog-to-digital converter of the type possessing a summing node, an analog signal input circuit for providing a to-be-measured input current to said summing node, and digital-to-analog converter circuit for providing a series of trial currents to said summing node, each trial current for a predetermined period of time and each trial current related to a digital number wherein the improvement comprises:

a sensing circuit connected to said summing node for sensing the polarity of net current at said summing node at a selected time within each said predetermined period, wherein said sensing circuit includes low impedance input circuit connected to said summing node for providing a single-ended control voltage in response to bipolar input currents at said summing node, said input means including first and second current sources each of which provides a constant current of magnitude I_1, and first and second NPN type transistors each possessing a respective emitter, collector and base, said first and second constant current sources connected respectively to said first and second

collectors, said second collector and said first and second bases connected together, said first emitter forming said single ended control voltage provided at said first collector;

a source of selected reference voltage; and

a differential amplifier circuit possessing a first input connected to said single ended control voltage, a second node connected to said reference voltage, a current feedback node connected to said summing node, and first and second low impedance differential output voltage nodes for providing an input current nulling feedback current at said summing node and a selected one of two stable differential voltage relationships at said output nodes when said input current is of one polarity and the other stable differential voltage relationship when said input current is of the other polarity, said differential amplifier including third and fourth current sources each of which provides a constant current of magnitude I_2; a fifth current source which provides a constant current of magnitude I_1; a source of selected negative supply voltage; third and fourth NPN type transistors each possessing a respective emitter, collector and base, said fifth current source connected to the interconnection of said third base, said fourth base and said fourth collector, said third and fourth emitters connected to said selected negative supply voltage; fifth and sixth PNP type transistors each possessing a respective emitter, collector and base, said third and fourth constant current sources connected respectively to said fifth and sixth emitters forming respectively said first and second low impedance differential output voltage nodes, said fifth collector connected to said third collector forming said current feedback node, said sixth collector connected to said fourth collector, said fifth and sixth bases forming respectively said first and second inputs; and

a differential current circuit connected to said first and second output nodes for clamping said selected one of two stable differential voltage relationships at said output nodes when said input current is of one polarity and said other stable differential voltage relationship when said input current is of the other polarity; wherein said differential current means includes a source of selected positive supply voltage; and seventh and eighth NPN type transistors each possessing a respective emitter, collector and base, said seventh and eighth collectors connected to said selected positive supply voltage, said seventh and eighth bases connected respectively to said first and second differential voltage output nodes, said seventh emitter cross-connected to said second output node and said eighth emitter cross-connected to said first output node.

4,114,150

ALARM SYSTEM

Shunji Yamazaki, Yokohama, and Hajime Masuda, Tokyo, both of Japan, assignors to Hochiki Corporation, Tokyo, Japan

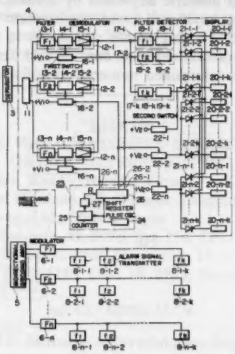
Filed Sep. 13, 1977, Ser. No. 833,072

Int. Cl.[2] G08B 1/08

U.S. Cl. 340—531 **6 Claims**

1. In an alarm system for subscribers having locations in group units and utilizing a bidirectional wired television system, said alarm system comprising a plurality of alarm signal transmitters located at the subscribers locations, said signal transmitters generating low frequency signals of frequencies common to respective of said group units, said frequencies being different for respective subscribers in respective group units, each of said transmitters being provided for each said subscriber; modulators for respective of said group units for modulating the low frequency signals from said alarm signal transmitters with different high frequency carrier signals; and an alarm signal receiving panel coupled to said modulators for receiving said modulated signals, said receiving panel including a plurality of demodulators for respective of said group units for demodulating said modulated signals through frequency selection in response to said high frequency carrier signals utilized for modulation, a plurality of detectors corresponding to the subscribers in each of said group units, said detectors being adapted to receive in common the output of each of said demodulators to detect the same through frequency selection in response to said low frequency signals, and a plurality of display means connected to said detectors and responsive to the presence or absence of the output of said detectors to display the locations of the alarm signal transmitters which have generated the low frequency signals or have stopped the generation of the low frequency signals, the improvement wherein:

(a) said display means includes a plurality of display devices provided one for each of said subscribers, said display devices being formed into similar groups to correspond to said subscribers, the display devices in each of said groups being connected to one of said detectors through a plurality of semiconductor control devices to display the locations of the corresponding ones of said subscribers; and



(b) said receiving panel further includes a plurality of first switching means for switching said demodulators to energized or deenergized condition, a plurality of second switching means each thereof connected to a corresponding group of said display devices to switch the same to energized or deenergized condition, said plurality of semiconductor control devices each thereof connected to one of said detectors, one of said second switching means and one of said display devices to actuate said one display device when each of said one detector and said one second switching means generates an output, and a scanning controller for sequentially energizing said first switching means and said second switching means periodically to periodically energize said demodulators and said groups of display devices sequentially for each of said group units.

4,114,151

PASSIVE TRANSPONDER APPARATUS FOR USE IN AN INTERROGATOR-RESPONDER SYSTEM

Phillip Raymond Michael Denne, Broadstone; David Evan Naunton Davies, Hemel Hempstead, and Colin Dougal McEwen, London, all of England, assignors to Alfa-Laval Company Limited, England

Filed Sep. 14, 1976, Ser. No. 723,621

Int. Cl.[2] G01S 9/56

U.S. Cl. 343—6.8 LC **12 Claims**

2. An interrogator-responder communication system for monitoring from an interrogating station information relating to a condition at a transponder station, comprising

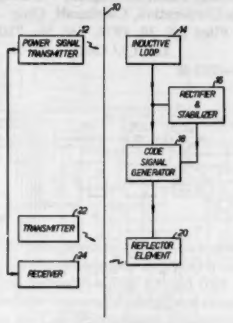
(a) first (22) and second (12) transmitters arranged at the interrogating station for directing first and second electromagnetic signals at different frequencies toward the transponder station;

(b) receiver means (24) arranged at the interrogating station; and

(c) passive transponder means arranged at the transponder station, said passive transponder means including

(1) signal receiving means including a first signal receiving element (20) for reflecting said first electromagnetic signal to said receiver means, said first signal receiving element having a variable electromagnetic signal reflective property at said first frequency;

(2) code signal generating means (18) for supplying a code signal to said first signal receiving means;



(3) power supply means for supplying direct-current operating power to said code signal generating means and to said modulating means, including

(a) second signal receiving means (14) for receiving a second electromagnetic signal having a second frequency different from said first frequency; and

(b) converter means (161) for converting said second signal to direct-current power; and

(4) modulating means responsive to said code signal for varying the signal reflection property of said first signal receiving element.

4,114,152
PULSE RADAR APPARATUS WITH INTEGRATION DEVICE

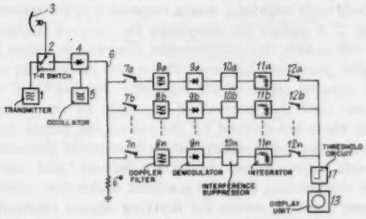
Kurt Wiedemann, Gilching, and Reinhard Seiferth, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jul. 7, 1970, Ser. No. 56,013

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1969, 1934723

Int. Cl.² G01S 9/42

U.S. Cl. 343—7.7 **10 Claims**



1. A Doppler pulse radar device comprising at least one range channel including a doppler filter, a demodulator connected to the output of said doppler filter, and an interference suppression circuit operable to block said radar device in response to receipt of impulse like interference signals which are of a short duration compared with the target scanning time and of great amplitude compared with target echo signals, said interference suppression circuit including an integrating device for integrating signals from said demodulator for retransmission to a display and means connected between said demodulator and said integrator for detecting the increase of an interference signal which is steep compared with the increase of a moving target echo signal and responsive thereto to prevent integration of a portion of an interference signal during the duration of such signal.

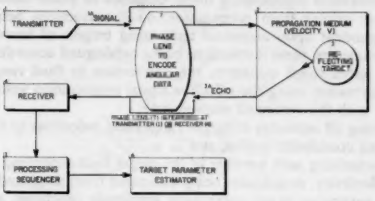
4,114,153
ECHO LOCATION SYSTEMS

Norman S. Neidell, 13054 Taylorcrest, Houston, Tex. 77024

Continuation of Ser. No. 483,202, Jun. 26, 1974, abandoned. This application Jun. 1, 1976, Ser. No. 691,674

Int. Cl.² G01S 9/44

U.S. Cl. 343—9 **8 Claims**



1. A method of using a transmitter member and an arrangement of receivers having at least one receiver member, all members being at locations referred to a coordinate system of fixed origin and in a medium having a known signal propagation velocity function, for ascertaining, for a field containing one or more reflecting targets, information about the targets' relfectivity strengths, positions and velocities as referred to said coordinate system, comprising the steps of:

producing a signal pattern having at least two individual member signals having preassigned time intervals, said time intervals and the durations of the member signals being short relative to a period over which velocity vectors describing motions of the transmitter, receivers and targets are approximately constants;

forming said individual member signals as a weighted sum of a design base signal pair, a pair of base signals approximately sharing a common smooth and essentially unimodel amplitude spectrum occupying a contiguous band of frequencies, said base signals being in mutual quadrature;

propagating said signal pattern with defined polarization character;

developing return signal patterns by reflection from the target field to each receiver;

processing reflected return signal patterns from each receiver by cross-correlating replicas of these return signal patterns with a detection base signal pair, thereby producing a pair of correlation component functions, said detection base signals having properties analogous to said design base signals, but with an amplitude spectrum overlapping that of the design base signal pair by an interval of frequency greater than any Doppler shift attributable to propagation toward and reflection from moving targets, the difference in phase angle between counterpart design and detection base signals at any common frequency component being described, in good approximation, mathematically by a constant and a term linear with frequency;

forming for each received return signal pattern a correlation amplitude function, formed from term-by-term sums of the absolute values of the correlation component functions raised to a like power not less than one, said sums then raised to a like power greater than zero but not greater than one;

identifying from the significant maxima of the correlation amplitude function return signal patterns corresponding to individual target reflections;

estimating for each detected target at each receiver a relative velocity component using the known signal propagation velocity function and the extension or compression of the initially preassigned time intervals between member signals in the return signal pattern for the target at the particular receiver, as determined from significant maxima of the correlation amplitude function;

estimating for each detected target at each receiver initial relative range information using an effective signal propagation velocity developed from the target's relative velocity estimate and known medium velocity function along with the elapsed signal travel time for onset of the return signal pattern identifying a target;

calculating final relative range information by introducing timing corrections to the elapsed signal travel time, such corrections representing linear elements of phase distortions arising from propagation, such corrections being dependent upon empirical tests using targets of known parameters, these corrections being catalogued according to initial range estimates, the conversion to final range information using the effective signal propagation velocity with the corrected elapsed time;

referring all estimates of target ranges and velocities to the fixed coordinate system; and

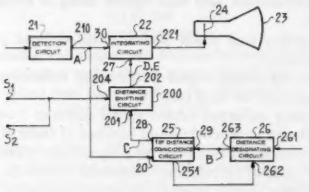
characterizing each member of the target field according to reflectivity, magnitudes being estimated from magnitudes of particular target correlation amplitude functions, accounting for losses associated with propagation and other observable and controllable signal amplitude modifications which are obtainable from empirical tests using targets of known parameters, and reflectivity polarities being determined from return signal pattern polarities as compared with the initial outgoing signal polarities.

4,114,154

ARRANGEMENT ENABLING THE CONTRAST TO BE IMPROVED BETWEEN THE MAIN ECHO VIDEO-FREQUENCY SIGNAL AND A SECONDARY ECHO VIDEO-FREQUENCY SIGNAL RECEIVED BY A PULSE COMPRESSION RADAR

Pierre Sarfati, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 22, 1977, Ser. No. 818,221
Claims priority, application France, Jul. 27, 1976, 76 22833
Int. Cl.[2] G01S 7/28
U.S. Cl. 343—17.2 PC **10 Claims**



1. An arrangement which enables contrast to be improved between the main echo video-frequency signal and a secondary echo video-frequency signal of a pulse compression radar receiver, each of said main and secondary echo signals consisting of a central peak and alternating secondary lobes, wherein said arrangement comprises:

means for integrating said main and secondary video frequency signals at a predetermined instant and for a time equal to the duration of the central peak of said secondary echo;

at least one distance coincidence circuit and a distance designating circuit of said main echo connected to said distance coincidence circuit, said means for integrating said main and secondary video frequency signals being controlled by said distance coincidence circuit and said distance designating circuit; and

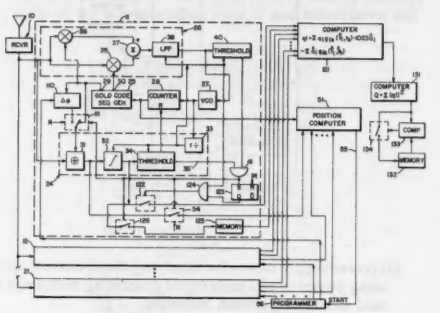
means connected to said integrating circuit for processing said main and secondary echo signal after integration.

4,114,155

POSITION DETERMINING APPARATUS AND METHOD

Frederick Herbert Raab, Burlington, Vt., assignor to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Jul. 30, 1976, Ser. No. 710,298
Int. Cl.[2] G01S 1/20
U.S. Cl. 343—105 R **17 Claims**

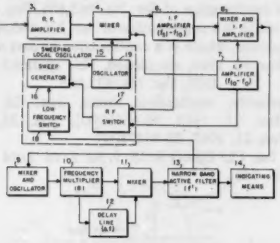


8. Apparatus for enabling the position of a receiver responsive to clear acquisition (C/A) signals derived from multiple space crafts of the Global Positioning System to be determined to an accuracy of greater than otherwise possible in response to the C/A signals, each of the C/A signals having the same carrier frequency and a different, predetermined Gold code sequence having a chipping rate of 1.023 megabits per second whose cross correlation products can prevent the position determination to be more accurate than to within 300 meters, comprising means responsive to C/A signals received at the receiver for separately detecting the C/A signal from each space craft, said detecting means including: means for locally deriving the different, predetermined Gold code sequences, means for acquiring the received sequences, said acquiring means including: means for calculating first cross correlation functions of the received and locally derived Gold code sequences over a Gold code sequence interval, and means for adjusting the phase of the locally derived Gold code sequences to achieve phase lock between each received and locally derived Gold code sequence; means responsive to the separately detected C/A signals for computing the receiver position to within 300 meters; the improvement comprising: means activated after phase lock has been achieved for individually varying the relative phase of the internally derived Gold code sequences over the interval of one chip of the sequence whereby there are derived by the calculating means signals representing second cross correlation functions of the received Gold code sequences and the locally derived Gold code sequences representing different positions within the computed 300 meter position, means for deriving signals representing third cross correlation functions of the internally derived Gold code sequences for the different positions within the computed 300 meter position, means for deriving a signal indicative of the amplitude of the signal from each space craft, and means for combining the signals representing the second and third cross correlation functions with the amplitude representing signal to enable the receiver position to be determined to an accuracy greater than 300 meters.

4,114,156
FREQUENCY SHIFT RATE DETECTOR

Robert R. Goldsborough, Sunnyvale; David R. Spencer, San Jose, and Samuel F. West, Sunnyvale, all of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 28, 1962, Ser. No. 176,890
Int. Cl.[2] G01S *11/00*
U.S. Cl. 343—112 S 3 Claims

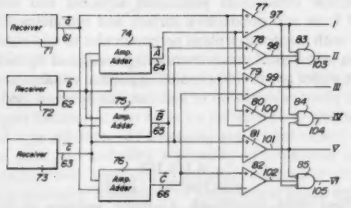


2. A doppler shift rate detector system comprising: a first mixer; input means for simultaneously applying a carrier signal and a doppler shifted sideband signal to said first mixer; first and second intermediate frequency amplifiers coupled to said first mixer; a mixer and an intermediate frequency amplifier stage coupled to said first and second intermediate frequency amplifiers; a mixer and oscillator stage coupled to said mixer and intermediate frequency amplifier stage; a frequency multiplier coupled to said mixer and oscillator stage; a second mixer coupled to said frequency multiplier; a delay line having an input coupled to said frequency multiplier and an output coupled to said second mixer, a narrow-band active filter coupled to said second mixer; an indicating means coupled to said filter; a low frequency switch coupled to said filter; a R.F. switch coupled to said first and second intermediate amplifiers; a sweep generator coupled to said R.F. switch and to said low frequency switch; and a variable frequency oscillator coupled between said sweep generator and said first mixer.

4,114,157
BEARING DETECTION SYSTEM

Toshikiyo Hirata, Samukawa, Japan, assignor to Toyo Ysushinki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 25, 1977, Ser. No. 772,248
Claims priority, application Japan, Mar. 4, 1976, 51-23560
Int. Cl.[2] G01S *3/28*
U.S. Cl. 343—119 5 Claims

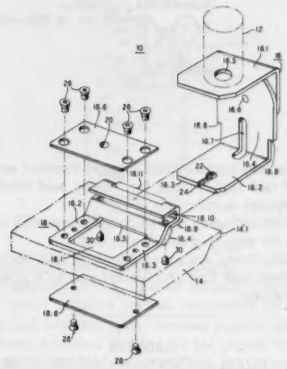


1. A bearing detection system having at its detection end a directional antenna comprising three radially extending directional antenna elements arranged at a 120° angle to each other and defining therebetween three directional antenna sectors, the detection system having means for making amplitude comparison of receiving signals received by said three directional antenna elements and forming a three bit truth table formed by the strength of the three receiving signals against six directions including the three directions of the antenna elements and the three directions of the sectors between said antenna elements, wherein in the truth table the signal values corresponding to 000 and 111 are made as undetectable.

4,114,158
MOUNT ASSEMBLY FOR ANTENNAS WITH MALE-FEMALE SECURING MEANS

Anthony J. Verini, 30 Lenox Ave., Green Brook, N.J. 08812

Filed Jun. 13, 1977, Ser. No. 805,889
Int. Cl.[2] H01Q *1/32*
U.S. Cl. 343—715 21 Claims



1. A universal assembly for mounting an antenna on the lip of an automobile trunk lid comprising

a stepped bracket including an upper tread on which said antenna is mounted, a lower tread having a recess therein and a groove extending from said recess to a free edge of said lower tread, and a riser connecting said treads together and having a window essentially centrally located therein,

a relatively narrow elongated support member mountable along said trunk lip; said support member including a pair of spaced, parallel guides defining a channel therebetween into which said lower tread is insertable and having a width substantially equal to the width of said lower tread, a cover plate partially enclosing said channel and having a male member thereon which protrudes into said channel and which is guided by said groove into said recess when said lower tread is inserted into said channel, and an L-shaped member having a base affixed above the entrance to said channel and a leg extending above said channel so as to define a slot into which said trunk lip in insertable, said window in said riser being adapted to receive said base when said lower tread is fully inserted into said channel,

a nonabrasive sleeve on said leg of said L-shaped member, and

means for orienting said support member on said trunk lip so that said antenna can be vertically aligned.

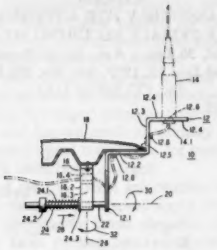
4,114,159
DUAL PIVOT MOUNT ASSEMBLY FOR AN AUTOMOBILE ANTENNA

Anthony J. Verini, 30 Lenox Ave., Green Brook, N.J. 08812

Filed Nov. 1, 1976, Ser. No. 737,552
Int. Cl.[2] H01Q *1/32*
U.S. Cl. 343—715 10 Claims

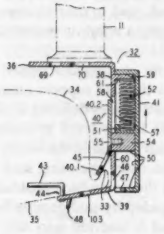
1. An assembly for mounting an antenna adjacent to the periphery of an opening in an automobile body comprising:

a support member pivotally mounted about a first axis to said body;
a support rod pivotally mounted to said support member about a second axis;
a bracket for carrying said antenna fixed to one end of said support rod;



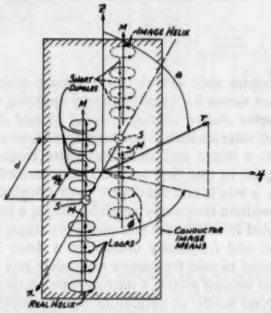
resilient means between said support member and the other end of said support rod for biasing said bracket toward said support member;
said bracket including means cooperating with said resilient means for engaging said body; and
said bracket being disengageable from said body and rotatable about said first and second axis to a position within said opening.

4,114,160
AUTOMOBILE ANTENNA MOUNTING BRACKET APPARATUS
Anthony J. Verini, 30 Lenox Ave., Green Brook, N.J. 08812
Filed Jan. 26, 1977, Ser. No. 762,442
Int. Cl.[2] H01Q *1/32*
U.S. Cl. 343—715 **13 Claims**



1. A bracket for mounting an antenna to an interior portion of a motor vehicle body frame and about a barrier means which is openable to provide access to the interior of the vehicle and is closable to bar entry into the vehicle, said frame having means defining at least one aperture through a prescribed interior portion thereof and comprising
a stepped bracket having a plurality of treads and at least one step riser secured between said treads,
a first one of said treads having means for securely mounting said antenna,
securing means for a second one of said treads admittable within said at least one aperture upon an opening of said barrier means and for affixing said second one of said treads between said prescribed interior portion of said frame and said barrier means when said barrier means is closed and
said securing means comprises a plurality of hookshaped, spaced apart rod extensions on an upwardly facing surface of said second one of said treads and
said defining means comprises means providing a pair of spaced apart apertures through said prescribed interior portion of said frame and for admitting said rod extensions into said interior portion of said frame.

4,114,161
MAGNETIC CURRENT ANTENNA
Yoshizo Shibano, Kobe, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan
Continuation of Ser. No. 364,344, May 29, 1973, abandoned, which is a continuation of Ser. No. 863,035, Sep. 30, 1969, abandoned, which is a continuation of Ser. No. 605,656, Dec. 29, 1966, abandoned, which is a continuation-in-part of Ser. No. 376,142, Jun. 18, 1964, abandoned. This application May 2, 1975, Ser. No. 573,885
Claims priority, application Japan, Jun. 21, 1963, 38-46468[U]; Jun. 21, 1963, 38-46469[U]; Jun. 21, 1963, 38-46470[U]; Jun. 21, 1963, 38-46471[U]
Int. Cl.[2] H01Q *9/16, 9/30, 1/48, 1/36*
U.S. Cl. 343—741 **9 Claims**

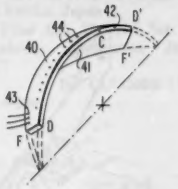


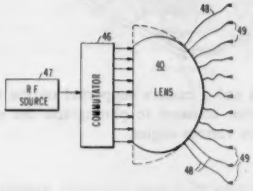
1. A magnetic current antenna comprising a plurality of helical conductors each forming a coil having its interior unobstructed with any conductive material and having one end electrically connected to a transmission signal from a signal generator, and a conductive surface adjacent to and uniformly spaced from said helical conductors and coextending in parallel with the longitudinal helical axis of each of said helical coils and extending away from each of said helical conductors in both directions transverse to each of said longitudinal helical axes at any given point therealong in a common straight line, for at least as long as the full underlying diameter span of said helical conductors, said conductive surface being spaced from said longitudinal axis of each of said helical coils a distance which is small compared to the antenna operating wave length, said helical conductors positioned adjacent and uniformly spaced from said conductive surface and symmetrically positioned with respect to a plane perpendicular to said conductive surface, said helical conductors being energized by said transmission signal to provide a radiation pattern variable by changing the phase relationship of and distance between said helical conductors.

4,114,162
GEODESIC LENS
John Paul Wild, Strathfield, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia
Filed Dec. 22, 1976, Ser. No. 753,383
Claims priority, application Australia, Dec. 24, 1975, PC4390
Int. Cl.[2] H01Q *19/06, 15/02, 15/24*
U.S. Cl. 343—754 **7 Claims**

1. An RF aerial system component for use in interconnecting an arcuate array of RF coupling elements and a linear array of RF transmitting and/or receiving elements comprising a geo-

desic lens consisting of a parallel plate waveguide in the shape of a quarter sphere, one curved edge of the lens being adapted





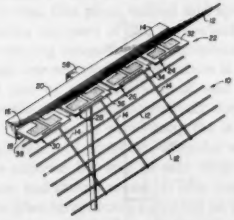
to be connected to the linear array, the other curved edge of the lens containing or being adapted to be connected to the arcuate array of RF coupling elements.

4,114,163

L-BAND RADAR ANTENNA ARRAY

John Joseph Borowick, Bricktown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 6, 1976, Ser. No. 747,765
Int. Cl.[2] H01Q *21/12, 9/28, 19/10*
U.S. Cl. 343—815 **9 Claims**



1. A radar antenna for monopulse radar apparatus particularly adapted for a foliage penetration mode of operation, comprising in combination:

a hinged foldable corner reflector including a grid of parallel rod type elements and a housing at the apex of said reflector, said grid including a plurality of transverse support members and longitudinal members secured to said support members, a plurality of longitudinal hinge members mounted along said housing and spaced about said apex, said transverse support members being secured to said hinge members;

flat dielectric support means positioned in line with said apex and extending from said housing;

an array of stripline dipole elements located on said support means along a common plane at said apex of said corner reflector, said reflector being foldable about opposite sides of said support means and dipole elements and extending parallel to said common plane in a folded position; and

means within said housing electrically coupling said array of dipole elements to said monopulse radar apparatus.

4,114,164

BROADBAND SPIRAL ANTENNA

John W. Greiser, Marina del Rey, Calif., assignor to Transco Products, Inc., Venice, Calif.

Filed Dec. 17, 1976, Ser. No. 751,712
Int. Cl.[2] H01Q *1/36*
U.S. Cl. 343—895 **18 Claims**

1. A broadband spiral antenna, including,

a tubular member having a planar surface at one end,

a planar spiral antenna portion supported on the planar surface and with the spiral antenna portion spiraling outward from a central position on the planar surface to an edge position on the planar surface, and

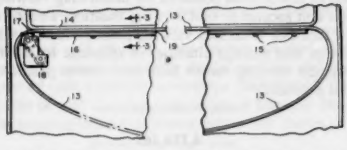
an array of dipole elements supported on and extending around the tubular member and coupled to the planar spiral antenna portion at the edge position.

4,114,165

PRECISION TRACK FOR MOVING FACSIMILE RECORDING BLADE

Kestutis E. Bliudnikas, North Grafton, Mass., assignor to Alden Research Foundation, Westboro, Mass.

Filed Dec. 27, 1976, Ser. No. 754,904
Int. Cl.[2] G01D *15/06*
U.S. Cl. 346—139 C **7 Claims**



1. Apparatus for electrically recording graphic signals on a web with a moving, loop electrode comprising:

a motor for driving the electrode in a looped path including a linear portion;

a linear track including two fixed walls for receiving the electrode and guiding the electrode on the linear portion; and

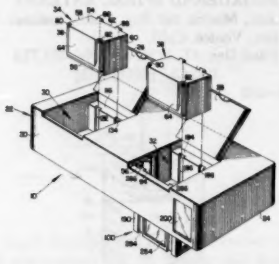
spring means on the track between the walls extending along the linear portion and engaging the side of the electrode so as to urge it against one of the walls of the track through the linear portion of the electrode whereby the loop is precisely straightened in its linear portion to provide straight line markings on the web.

4,114,166

SELF-DEVELOPING CAMERA AND VIEWER

John J. Driscoll, Andover, and Richard R. Wareham, Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 10, 1976, Ser. No. 749,511
Int. Cl.[2] G03B *29/00*
U.S. Cl. 354—76 **48 Claims**



1. A self-developing camera for exposing, processing, viewing and storing self-developing film units of the type including an integral supply of fluid processing composition adapted to be distributed between predetermined layers of the film unit subsequent to exposure, said self-developing camera comprising:

a camera housing;

means for locating such a self-developing film unit at an exposure position within said camera housing;

means for exposing the film unit located at said exposure position;

pressure applying means for applying a compressive pressure to the film unit subsequent to exposure to effect the distribution of the fluid processing composition;

means for defining a storage chamber within said camera housing and within which the film unit is adapted to be stored subsequent to the application of said compressive pressure, said storage chamber being configured such that a film unit located for storage therein is not visually accessible to the user of said camera for viewing; and

film unit viewing means mounted on said camera housing for movement relative thereto between first and second positions for moving the film unit from a storage location in said storage chamber to a viewing position wherein the film unit is visually accessible for viewing in response to moving said film unit viewing means from said first position to said second position, for facilitating viewing of the film unit located at said viewing location, and for moving the film unit from said viewing position to a storage location in said storage chamber in response to moving said film unit viewing means from said second position to said first position.

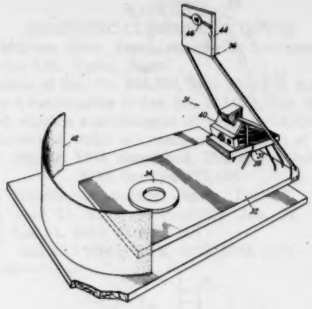
4,114,167

MINIATURIZED MODEL KITCHEN HAVING COORDINATED INTERCHANGEABLE AND INTEGRATABLE MODULES

Harry A. McKee, 6851 Roswell Rd., Atlanta, Ga. 30328

Division of Ser. No. 757,398, Jan. 6, 1977. This application May 26, 1977, Ser. No. 800,617
Int. Cl.[2] G03B *29/00*
U.S. Cl. 354—81 **4 Claims**

1. A stand for assembling a miniature model kitchen or the like comprising a platform, a turntable rotatably mounted on said platform, an upper camera mount positioned on said base above said turntable for mounting a camera with line of sight directed vertically with respect to said base, a lower camera mount positioned on said base adjacent said turntable for mounting a camera with line of sight directed at a downward incline toward said base, and a floor surface resting on said turntable, whereby a miniature model kitchen or the like can be assembled on the floor surface and the floor surface rotated



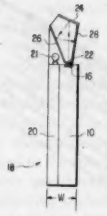
with the turntable and a camera supported on the upper or lower camera mount actuated to photograph the miniature model kitchen from various angles.

4,114,168

FILM STRIP RECORDER AND VIEWER

George J. Yevick, Leonia, N.J., assignor to Izon Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 624,253, Oct. 20, 1975, abandoned. This application Apr. 8, 1977, Ser. No. 785,039
Int. Cl.[2] G02B *5/14*; G03B *33/00, 21/26, 27/44*
U.S. Cl. 354—102 **21 Claims**



1. A compact optical device including,

(a) a cassette film, having a width substantially less than its length, and having its ends wound upon spools,

(b) a run of said film, between the two spools, a plurality of active lenses associated with said run, said active lenses being distributed across the width of the film and being spaced from each other longitudinally of said run such that each active lens corresponds to a portion of the width of the film, the optic axes of the lenses being at right angles to the plane of the run of film,

(c) means for illuminating and projecting portions of said run adjacent said lenses, whereby projected light in the form of cones passes through the film and through the lenses,

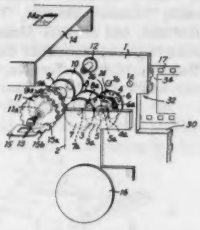
(d) a rear projection viewing screen for receiving an image,

(e) means for folding said projected light cones to effectively shorten the distance between the said film and the said rear projection screen.

4,114,169
CAMERA WITH DATA-RECORDING STRUCTURE

Eiji Yamamori, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Aug. 27, 1976, Ser. No. 718,414
Claims priority, application Japan, Nov. 17, 1975, 50/155231[U]
Int. Cl.[2] G03B 17/24
U.S. Cl. 354—106 9 Claims

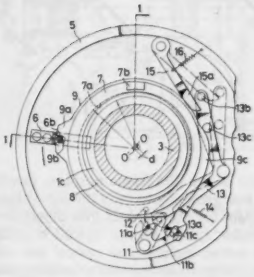


1. In a camera, film-guide means for guiding film for movement in a predetermined film plane and defining an exposure aperture through which film in the film plane is exposed, said aperture having a peripheral region situated in front of a peripheral part of an area of a film strip which is exposed through said exposure aperture, indicia-carrying means situated adjacent said film-guide means and carrying indicia to be photographically recorded on a film strip in response to light travelling through said indicia-carrying means to film in said film plane, support means supporting said indicia-carrying means for movement to a selected one of a plurality of different possible positions in which different items of indicia are respectively situated closely adjacent to said aperture in front of said peripheral region thereof, the camera including an objective means, diaphragm means, and shutter means all operative to expose film in said film plane behind said aperture while also providing during exposure of film light which travels through said indicia-carrying means for photographically recording on the film at least one selected item of indicia in accordance with the selected one of said positions of said indicia-carrying means, and positioning means operatively connected with said indicia-carrying means for positioning the latter in a selected one of said plurality of positions, whereby when film in said film plane is exposed by way of said objective means, diaphragm means, and shutter means, at least one selected item of indicia will be photographically recorded on the film strip with the same light that travels through the objective means, diaphragm means, and shutter means to expose the film in the film plane to an image of a given object which is to be photographed, said indicia-carrying means including a pair of coaxial discs supported for rotation about their common axis, respectively situated in parallel planes which are parallel to said film plane, and respectively having peripheral edge regions situated in front of said peripheral region of said aperture, one of said discs having a diameter greater than the other and having its peripheral edge region situated outwardly beyond the peripheral edge region of the other disc, while carrying one set of indicia beyond the peripheral edge region of said other disc, the latter carrying a second set of indicia to be selectively positioned in front of said peripheral region of said aperture, and said positioning means being operatively connected with said discs for turning the latter independently of each other about their common axis so that a selected item of indicia of one disc and a selected item of indicia of the other disc can be positioned to be photographically recorded on the film.

4,114,170
FLASH MECHANISM FOR CAMERA

Akio Furukawa, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 12, 1977, Ser. No. 796,072
Claims priority, application Japan, May 12, 1976, 51-60027[U]; May 12, 1976, 51-60028[U]
Int. Cl.[2] G03B 7/16, 15/03, 13/02
U.S. Cl. 354—149 3 Claims



1. A flash mechanism for a camera of the type comprising:
diaphragm and shutter means for opening and closing a light imaging path in said camera; and
pin means for driving said diaphragm and shutter means and movable along a predetermined path whose length is proportional to the amount of the opening of said light imaging path; said mechanism comprising:
diaphragm linkage lever means for entering said path of movement of said driving pin means when an illumination device is attached to said camera, and for retracting from the path of movement of said pin means when the illumination device is detached;
an intermediate linkage lever means for respectively moving in response to the attachment and detachment of said illumination device and cooperatively linked to said diaphragm linkage lever means for accordingly operating said diaphragm linkage lever means in response to said respective movements;
rotatable distance ring means for adjusting the focussing of said camera and having a distance cam means thereon for engaging said intermediate linkage lever means to limit the extent of its respective movement in response to the attachment of the illumination device; and
rotatable exposure correction means for setting the exposure of said camera and which supports and is relatively rotatable to said distance ring means; and wherein the center of rotation of said distance ring means on said exposure correction means is slightly displaced from the rotation center of said exposure correction means such that the position of said distance cam means is laterally displaced upon rotation of said exposure correction means.

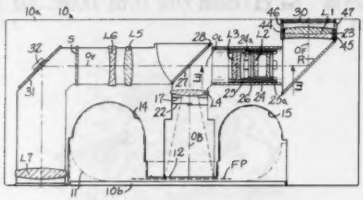
4,114,171
REFLEX CAMERA WITH INTERNAL ZOOM LENS

Richard M. Altman, Woodland Hills, Calif., assignor to Vivitar Corporation, Santa Monica, Calif.

Filed Apr. 6, 1976, Ser. No. 674,229
Int. Cl.[2] G02B 15/00; G03B 19/12, 17/04, 3/00
U.S. Cl. 354—152 24 Claims

1. A camera comprising a housing, a photographic lens in said housing on an optical axis which has first and second forward axis portions essentially perpendicular to the frame of film inserted in the camera but laterally displaced from each other, said second axis portion directed to intersect the frame of film inserted in the camera and a lateral axis portion between said first and second axis portions, said lens from the object end

to image end comprising a first objective lens group on said first forward axis portion, first reflecting means changing said first forward axis portion to said lateral axis portion, a movable lens grouping on said lateral axis portion for varying the equivalent focal length of the lens, second reflecting means changing said lateral axis portion to said second forward axis portion, a stationary second objective lens group on said second axis



portion in front of the film frame position, means for moving said movable lens grouping to vary the equivalent focal length of the lens, means for moving said first objective to focus said lens, a viewfinder optical system in said housing, said viewfinder optical system including an optical axis which is a continuation of said lateral axis portion extending past said second reflecting means and a focusing screen and an eyepiece in said viewfinder optical system.

4,114,172

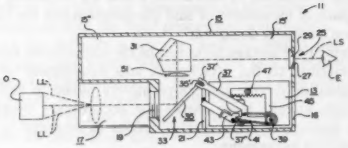
PHOTOGRAPHIC CAMERA AND FILM CARTRIDGE THEREFOR

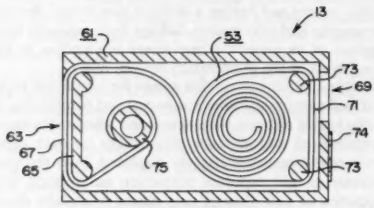
Joe Yao, 204 Lampkin Rd., Starkville, Miss. 39762

Filed Nov. 8, 1976, Ser. No. 740,123

Int. Cl.[2] G03B *19/12, 17/26*

U.S. Cl. 354—153 **9 Claims**





1. A photographic camera comprising: a hollow, boxlike body means; lens means attached to said body means for allowing lines of light to pass from an object being photographed into the interior of said body means; a film cartridge including a substantially nontransparent housing member, a strip of photographic film located within said housing member, an exposure window through said housing member for allowing light to enter said housing member therethrough and to expose a portion of said film, and a take-up spool for receiving said film after it has been exposed, said take-up spool being positioned behind said exposure window and in-line with the centermost rays of light passing through said exposure window, said film being positioned within said housing member with any exposed portion thereof substantially wound around said take-up spool and with any unexposed portion thereof substantially unconstrainedly located within said housing member; and means for selectively allowing said lines of light entering said interior of said body means to enter said exposure window of said film cartridge; said film cartridge being positioned within said interior of said body means with said lines of light passing between said lens means, said exposure window of said film cartridge and said portion of said film.

4,114,173

PHOTOGRAPHIC CAMERA WITH AN OPERATION MODE DISPLAY DEVICE

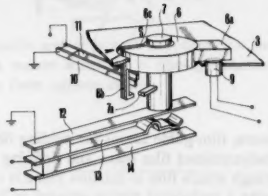
Nobuo Tezuka, Tokyo; Masanori Uchidoi, Yokohama; Yukio Iura, Yokosuka; Masami Shimizu, Tokyo; Ryoichi Yoshikawa, Yokohama, and Hiroshi Aizawa, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1977, Ser. No. 758,200

Claims priority, application Japan, Jan. 20, 1976, 51-5194

Int. Cl.[2] G03B *9/64, 17/00*

U.S. Cl. 354—238 **6 Claims**



1. A photographic camera having a mode display device comprising:

a. an electric self-timer means;

b. a shutter button for operating a shutter release;

c. a self-timer operation mode display means visually recognizable from outside of the camera, said means being electrically connected to the electric self-timer means; and

d. a shielding means, said means being rotatably coaxial with the shutter button and movable between the one position at which the self-timer operation mode display means is visually recognizable and the other position at which the self-timer operation mode display means is not visually recognizable.

4,114,174

SHUTTER OPENING AND CLOSING MECHANISM FOR CAMERAS

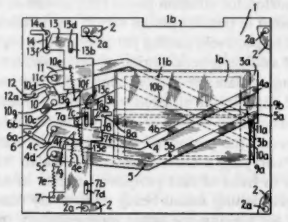
Eiichi Onda; Masanori Watanabe; Tadashi Nakagawa; Ichiro Nemoto, and Mitsuo Koyama, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Feb. 8, 1977, Ser. No. 766,745

Claims priority, application Japan, Feb. 9, 1976, 51-12960; Feb. 9, 1976, 51-13745[U]

Int. Cl.[2] G03B *9/38*

U.S. Cl. 354—249 **9 Claims**



1. A camera shutter comprising an opening blade and a closing blade operated sequentially to open and close a shutter

aperture for an exposure, and blade opening and closing mechanism comprising: an opening spring normally biasing the opening blade to move from a closed position in which the opening blade covers the shutter aperture to an open position in which the opening blade uncovers the shutter aperture; a second spring normally biasing the closing blade to move from a closed position in which the closing blade covers the shutter aperture to an open position in which the closing blade uncovers the shutter aperture; a third spring normally biasing the closing blade to move from said open position to said closed position, and means controlling operation of the blades in the manner that when the shutter is in charged condition said opening blade and said closing blade are in said closed position and when the shutter is released, the closing blade is moved under the bias of said second spring from said closed position to said open position, then the opening blade is moved under the bias of said opening spring from said closed position to said open position, and thereafter said closing blade is returned under the bias of said third spring from said open position to said closed position, thereby completing the exposure.

4,114,175

SHUTTER MECHANISM

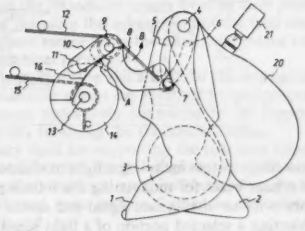
Leonhard Huber, Glonn; Helmut Kirschner, Munich, and Herbert Muller, Assling, all of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany

Filed Jan. 28, 1977, Ser. No. 763,684

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603657

Int. Cl.² G03B 9/08

U.S. Cl. 354—252 **10 Claims**



1. In a shutter mechanism, in combination, an aperture-unblocking member mounted for movement between an aperture-blocking position and an aperture-blocking position; a drive mechanism engaging said aperture-unblocking member; an inertial braking mechanism driven by said drive mechanism when said aperture-unblocking member moves from said blocking to said unblocking position and operative during such movement for applying to said drive mechanism an inertial braking force slowing the movement of said member to said unblocking position, said drive mechanism including a drive cam, said inertial braking mechanism including a driven cam, the surface of said drive cam bearing upon the surface of said driven cam and transmitting to said driven cam the drive force by means of which said drive mechanism drives said intertial braking mechanism, said cams being so configured that as said drive mechanism drives said inertial braking mechanism during said movement from aperture-blocking to aperture-unblocking position, the surface of said drive cam rolls along the surface of said driven cam with predetermined unique successive parts of the surface of the drive cam successively contacting respective predetermined unique successive parts of the surface of the driven cam.

4,114,176

WEAK CAMERA BATTERY WARNING CIRCUIT

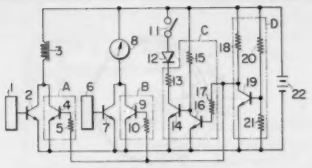
Masahiro Kawasaki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1977, Ser. No. 828,689

Claims priority, application Japan, Aug. 31, 1976, 51-116553[U]

Int. Cl.² G03B 7/00, 17/00

U.S. Cl. 354—289 **5 Claims**



1. A circuit arrangement for warning when a camera battery supply voltage falls below a predetermined threshold level, comprising:

(a) circuit means for detecting when the battery voltage falls below the predetermined threshold level and for producing an output signal in response thereto,

(b) a first drive circuit for rendering a shutter control magnet continuously energized in response to said output signal,

(c) a second drive circuit for causing a shutter speed display element to indicate an extreme value in response to said output signal, and

(d) a third drive circuit for disabling a battery test indicator in response to said output signal.

4,114,177

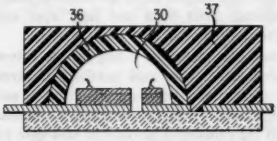
OPTICALLY COUPLED DEVICE WITH DIFFUSELY REFLECTING ENCLOSURE

William Clifton King, Short Hills, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 1, 1975, Ser. No. 573,401

Int. Cl.² H01L 31/14

U.S. Cl. 357—19 **4 Claims**



1. A device comprising at least one first semiconductor device for emitting light in response to an impressed electrical excitation, at least one second semiconductor device, for receiving the light emitted by the first semiconductor device and for producing an electrical signal in response to the light, an electrically insulating light transmitting medium for transmitting the light from the first semiconductor device to the second semiconductor device, and an enclosure CHARACTERIZED IN THAT the enclosure includes a body of reflecting material adapted for diffusely reflecting the light, wherein the reflecting material is a polymeric material including a particulate pigment which is reflective to the emitted light.

4,114,178

SEMICONDUCTOR CONTROLLED RECTIFIER HAVING AN AUXILIARY REGION WITH LOCALIZED LOW RESISTANCE PATHS TO THE CONTROL GATE

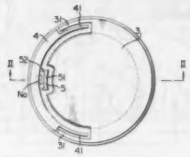
Yoshio Terasawa, Katsuta, and Shin Kimura, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

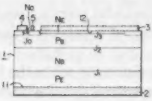
Filed Jan. 27, 1976, Ser. No. 652,662

Claims priority, application Japan, Feb. 7, 1975, 50-15404

Int. Cl.[2] H01L *29/74*

U.S. Cl. 357—38 **13 Claims**





3. A semiconductor controlled rectifier comprising:

a semiconductor substate having a pair of main surfaces on the opposite side of said substrate, a four layer structure between said main surfaces consisting of at least a first, a second, a third and a fourth layer of alternate p-n and n-type conductivities, one of said main surfaces being formed of the exposed surfaces of at least said first and second layers and the other main surface being formed of the exposed surface of at least said fourth layer, and an auxiliary region, having the same conductivity type as said first layer and a smaller area than said first layer, formed in said second layer with a p-n junction defined between said auxiliary region and said second layer and exposed to said one main surface;

a first main electrode kept in low resistance contact with at least said first layer on said one main surface;

a second main electrode kept in low resistance contact with at least said fourth layer on said other main surface;

a gate electrode extending along theperiphery of said auxiliary region so as to be closer to said auxiliary region than to said first layer, said gate electrode being disposed on said one main surface; and

an auxiliary electrode disposed in contact with said auxiliary region and said second layer on said one main surface and being spaced apart from said first layer and extending along the periphery of said first layer; and

wherein said gate electrode is disposed to extend along and be spaced apart from said auxiliary electrode, and the electrical resistance between a portion of said gate electrode and said auxiliary electrode is smaller than that between the remaining portion of said gate electrode and said auxiliary region.

4,114,179

CLAMPING CIRCUITS FOR TELEVISION SIGNALS

Peter John Ilieve, London, England, assignor to Decca Limited, London, England

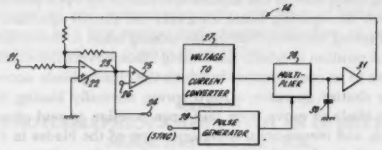
Filed Jun. 30, 1977, Ser. No. 811,877

Claims priority, application United Kingdom, Jul. 5, 1976, 27935/76

Int. Cl.[2] H04N *9/535, 5/18;* H03G *11/00*

U.S. Cl. 358—34 **9 Claims**

1. A method of clamping an input signal to a reference, in which method the amplification of an error signal, which represents disparity between the input signal and the reference, is greatest at the beginning of a period of clamping and diminishes during that period, and the error signal is integrated before it is applied to reduce the disparity.



4,114,180

CLOSED LOOP LASER NOISE ELIMINATION FOR OPTOELECTRONIC RECORDING

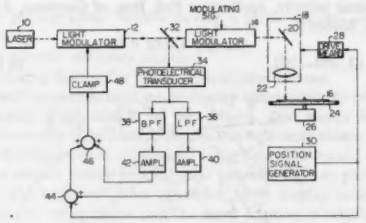
Kanji Kayanuma, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Sep. 13, 1977, Ser. No. 832,890

Claims priority, application Japan, Sep. 14, 1976, 51-110057

Int. Cl.[2] G11B *7/00;* H03F *1/28, 1/30*

U.S. Cl. 358—128 **7 Claims**



1. A recording system including a light modulator receptive in use of a laser beam for modulating the intensity thereof in accordance with an intelligence signal and means for sequentially subjecting a selected portion of a light sensitive recording medium to the intensity modulated laser beam, wherein said laser beam is subject to broad-spectrum noise, comprising:

a photoelectrical transducer;

means disposed in the path of said beam for directing a portion of the beam incident to said light modulator to said photoelectrical transducer;

means for dividing the frequency spectrum of the output from said transducer into a plurality of separate frequency bands and accentuating the signal of each of said separate frequency bands such that each of said bands has an amplitude versus frequency characteristic which substantially conforms to a portion of the frequency response characteristic of said broad-spectrum noise of said laser beam incident to said photoelectrical transducer; and

a second light modulator disposed in the path of said laser beam incident to said beam directing means for modulating the intensity thereof in accordance with said accentuated signals, whereby a feedback control loop is formed for each of said divided frequency bands,

the signal in each of said divided frequency bands being accentuated such that each feedback control loop has a maximum loop gain which suppresses the noise of the corresponding portion of the noise spectrum to an acceptable level.

4,114,181

RECORDING REPRODUCER FOR MAGNETIC CARDS

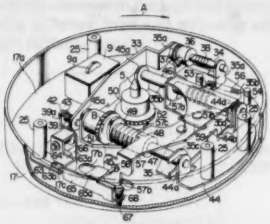
Tadanao Itoh, Tokyo, Japan, assignor to Ricoh Company, Ltd. and Ricoh Educational Equipment Co., Ltd., both of Tokyo, Japan

Filed Oct. 12, 1976, Ser. No. 731,679

Claims priority, application Japan, Dec. 8, 1975, 50-146087; Dec. 16, 1975, 50-150414; Oct. 18, 1975, 50-142028[U]; Oct. 18, 1975, 50-142029[U]

Int. Cl.[2] G11B *25/04, 5/52*

U.S. Cl. 360—2 6 Claims



1. A recording reproducer for use with a card having a sound track formed on its surface, comprising:

a rotatable turntable;

transducer means disposed on said turntable for following said sound track to sense the content thereof;

support means for movably supporting the transducer means on said turntable;

feed means for driving the support means to move the transducer means radially of the turntable between a start and a terminal position;

means for engaging the feed means with the support means to move the transducer means from its start position;

means for releasing the engagement of the feed means with the support means when the transducer means has moved to its terminal position;

means for maintaining the release of the engagement until the transducer means has returned to its start position;

return means operatively connected to the support means for rapidly returning the transducer means;

a stationary shaft for supporting the rotatable turntable;

a disc member substantially integrally mounted on said stationary shaft and having a spirally extending guide groove of V-shaped cross section formed in the upper surface thereof; and

an operating lever means for operatively supporting the transducer means such that both are slidable on and rotatable with the turntable, said lever means having an edge of an acute angle which engages the guide groove, thereby moving the transducer means radially of the turntable.

4,114,182

CASSETTE TURNING MECHANISM

Werner Zeh, and Dieter Kühnlein, both of Nuremberg, Germany, assignors to Grundig E.M.V., Fuerth, Bay, Germany

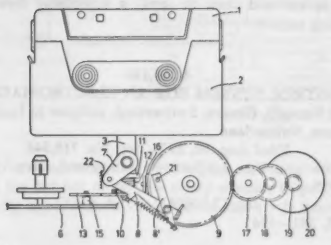
Filed Jun. 2, 1977, Ser. No. 802,714

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651489

Int. Cl.[2] G11B *5/00*

U.S. Cl. 360—92 1 Claim

1. A cassette turning mechanism operable with a tape-cassette utilized for recording and replaying of two opposing tape tracks, the cassette being insertable into a receptacle mounted on a tape recorder, and, at the end of one tape track, either automatic or manual means on the recorder, the receptacle moves the cassette out of a first position in a receiving nest in the recorder which contains the necessary tape drive and tape recording elements, the improvement comprising; a shaft centrally mounted along the edge of the receptacle opposite to the cassette receiving edge and extending substantially perpendicular therefrom, a swing axle with the shaft rotatably mounted thereon, the swing axle running parallel with respect to said opposite receptacle edge, the swing axle being rotatable around its longitudinal axis, a control drive means for rotating the swing axle around its longitudinal axis and pivoting the receptacle and cassette from the first position within the tape recorder to an extended second position, a spur gear mounted on said shaft and engaging said control drive means after the pivot movement of the receptacle to the second position so that the control drive rotates the shaft together with the receptacle by 180°; after which the receptacle is adapted to be returned to the first position and the other tape track can be transduced, the control drive including a control motor, intermediate wheels and a control wheel interconnected so that the control motor drives the control wheel by use of the intermediate wheels, a crank arm is mounted on the swing axle, a pair of links in form of a crank drive coupling the control wheel and the crank arm, the control wheel has a flat side, a face cam mounted on the side of the control wheel, and a rack including a cam follower means engaged by the face cam and being under spring tention.



4,114,183

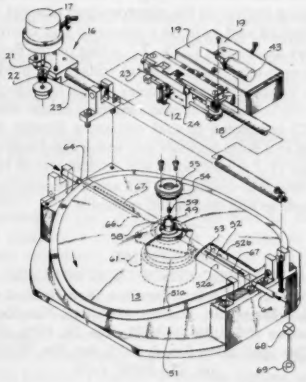
RECORDING SYSTEM WITH GAS SUPPORTED RECORD MEDIUM

Kingston Ganske, Auburn; Earl R. Hibbard, Berkeley; Mervin L. Falk, Sunnyvale, and Joseph P. Denk, Newark, all of Calif., assignors to Insurance Technology Company, Berkeley, Calif.

Filed Apr. 11, 1977, Ser. No. 786,234

Int. Cl.[2] G11B *5/60*

U.S. Cl. 360—99 4 Claims



1. In a recording system of a type employing a pliant recording disc and transducer means disposed to advance and retreat across the disc in cooperative relation therewith for transducing signals between the transducer and the disc, means for

moving and supporting the disc relative to the transducer comprising a base member having a surface underlying the disc, said surface including a crest region beneath the path of the transducer defined by flanking crowned surface portions sloping away from said crest region, said crest including a flat radially extending surface serving to form a reference surface beneath the disc, said flat radially extending surface including therewithin an elongate slit means for supplying gas to the underside of the disc via the slit, means for moving the disc in surface-following relation across said crest region to cause a change in direction of the plane of the recording surface as it passes across said crest to apply a smoothing force to the recording surface.

4,114,184

CONTROL SYSTEM FOR AN ELECTROMAGNET

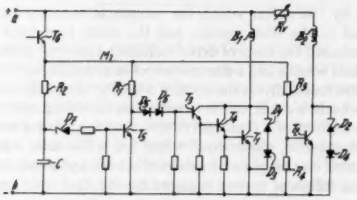
Harald Stampfli, Geneva, Switzerland, assignor to Lucifer S.A., Geneva, Switzerland

Filed Aug. 30, 1976, Ser. No. 718,545

Claims priority, application Switzerland, Sep. 5, 1975, 11569/75

Int. Cl.[2] H01H *47/04, 47/32*

U.S. Cl. 361—154 **3 Claims**



1. Control system for an electromagnet for furnishing a high initial current upon energizing, followed by a smaller maintenance current, containing a first semiconductor (T_1), whose conductivity is controllable, connected in a first circuit adapted to control the initial current, and a second semiconductor (T_2), whose conductivity is controllable, connected in a second circuit adapted to control the maintenance current, a control circuit (M, R_1, D_5, D_6, T_3, T_4) common to the two semiconductors, switching means (T_6) for applying to the control circuit a control voltage that will simultaneously render the two semiconductors (T_1, T_2) conductive, a power line for supplying current to the electromagnet adapted to be connected through said switching means to said control circuit, and a delay device (R_2, C, D_7, T_5) acting on the first semiconductor so as to eliminate its control voltage at a predetermined time after its application, said delay device including a resistor (R_2) directly connected to said switching means and to a condenser (C) connected to said resistor, a Zender diode (D_7) connected to a point between said resistor and said condenser, a transistor (T_5) connected to said control circuit for controlling said first semi-conductor (T_1), and a connection from said Zener diode to said last named transistor.

4,114,185

ELECTRIC FENCE CONTROLLERS

William Murray Gallagher, Hamilton, New Zealand, assignor to Gallagher Electronics Limited, Hamilton, New Zealand

Continuation of Ser. No. 568,101, Apr. 14, 1975, abandoned. This application Jan. 6, 1977, Ser. No. 757,288

Int. Cl.[2] H05C *1/04*

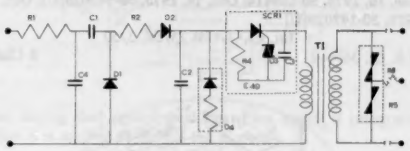
U.S. Cl. 361—232 **2 Claims**

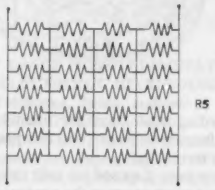
1. A device connected to a voltage source and an electric fence having a normal fence line impedance for controlling said electric fence, said device comprising:

a capacitance connected to and adapted to be charged by said voltage source to a substantially predetermined voltage;

timing means operatively connected to said capacitance for discharging said capacitance at fixed time intervals;

a transformer, the primary thereof connected across said capacitance and said timing means and the secondary thereof connected to the fence and to a ground; and





an impedance connected to said transformer, said impedance measured at the operating voltage for the secondary terminals of said transformer being less than the fence line impedance, and said impedance being comprised of a plurality of resistors connected in series parallel arrangement in such a manner that failure of less than three resistors will not materially alter the overall resistance of said resistors

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4,114,186

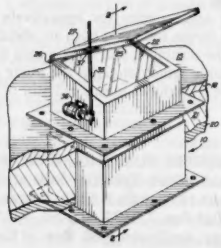
LIGHTING FIXTURE

Richard Lee Dominguez, 3835 W. Eva Ave., Phoenix, Ariz. 85021

Filed May 26, 1977, Ser. No. 800,634

Int. Cl.[2] F21V *21/30*

U.S. Cl. 362—35 **11 Claims**



1. A lighting fixture for use in the ceiling of a room in a building to be lighted, said building having a roof, comprising:

(a) means defining a hollow light duct extending from the roof of said building to the ceiling of the room to be lighted;

(b) a light admitting panel mounted at one end of said light duct on the roof of said building;

(c) an opaque lid hingeably secured to said light duct adjacent said light admitting panel, said lid having a light reflecting surface to direct daylight through said light admitting panel into said duct; said light reflecting surface

of said lid being positionable from nearly vertical to a closed position covering said light admitting panel when artificial light is to be used;

(d) a light diffusing panel enclosing said duct at the ceiling of said room;

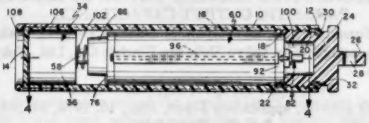
(e) light transmitting, heat insulating means mounted in said duct below the level of said roof; and

(f) an artificial light source, mounted in said duct, for generating light when said daylight is insufficient to provide the desired light level in said room, light from said artificial source being transmitted through said light diffusing panel and being reflected from said reflecting surface through said light diffusing panel.

4,114,187
DIVER'S FLASHLIGHT

Alan Kurt Uke, 530 Couper Dr., San Luis Obispo, Calif. 93401

Filed Nov. 5, 1976, Ser. No. 739,290
Int. Cl.[2] F21L *11/00*
U.S. Cl. 362—158 **6 Claims**



1. A diver's flashlight comprising:

an elongated, substantially cylindrical transparent casing having an open end and a closed transparent window end,

a reflector in said casing at said window end and having a bulb mounted in focal relation therein,

battery pack means for being positioned in said casing and having contact means for circuit completing contact with said bulb,

a spring separating said battery pack from physical contact with said bulb,

said open end of the casing having screw threads therein,

threaded plug means for being engaged in said screw threads and abutting said battery pack to drive the battery pack against said spring when the plug means is screwed into the casing,

an O-ring on said plug, and

said screw threads being inset and said casing having a smooth internal hole at the open end thereof, against which said O-ring seals.

4,114,188
APPARATUS FOR INDICATING UTERINE ACTIVITY IN LABOR

Michael Charles Carter, and Philip James Steer, both of London, England, assignors to National Research Development Corporation, London, England

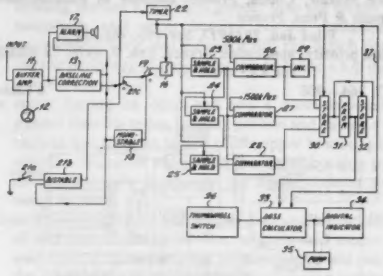
Filed Jan. 5, 1977, Ser. No. 757,024
Claims priority, application United Kingdom, Jun. 23, 1976, 26042/76
Int. Cl.[2] A61B *5/04, 5/10*; G06F *15/42*
U.S. Cl. 364—415 **22 Claims**

1. Apparatus for indicating uterine activity in labour including:

means adapted to be coupled to a uterine pressure transducer for providing a first signal representative of intrauterine pressure,

means for providing a second signal which is equal to the first signal except when a contraction occurs when it takes up a value equal to that of the first signal in the absence of the contraction,

means for substracting the second signal from the first signal, to provide a third signal, and

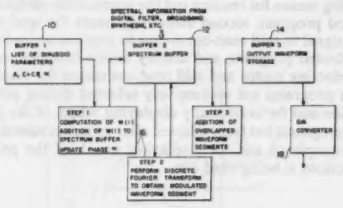


means for integrating the third signal over intervals of at least ten but not more than thirty minutes to provide an activity signal indicative of uterine activity in labour.

4,114,189
DIGITAL SIGNAL SYNTHESIS SYSTEM

Robert H. Davis, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 9, 1975, Ser. No. 639,031
Int. Cl.[2] G06F *15/34*
U.S. Cl. 364—718 **13 Claims**



1. A process for digital synthesis of a complex waveform having one or more sinusoidal components of arbitrary frequency, amplitude, and phase, comprising the steps of:

spectrally describing each of said sinusoidal components in the frequency domain with a spectral description formed by:

selecting for each of said sinusoidal components a set of spectral cells spaced-apart in order by a predetermined frequency, f_c, each cell potentially representing any complex value in the frequency domain;

determining for each of said spectral cells the magnitude and phase of a complex value according to a raised cosine modulation function, each value varying in dependence upon the order of the respective one of said spectral cells within its set; and,

adding each complex value to the value represented by the respective one of said spectral cells;

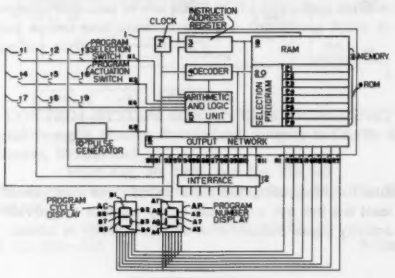
periodically transforming each said spectral description from the frequency domain to the time domain to provide successive samples forming segments of the respective said sinusoidal components; and,

overlapping successive of said segments having an identical frequency by 50 percent of their period to provide unmodulated segments of each of the components.

4,114,190
ELECTRONIC PROGRAMMER HAVING AUTOMATIC PROGRAM SELECTION

Maurice Mazuir, Cluses, France, assignor to Etablissements Carpano & Pons, France

Filed Jan. 25, 1977, Ser. No. 762,231
Claims priority, application France, Feb. 9, 1976, 76 03800
Int. Cl.[2] G06F *9/06, 3/02*
U.S. Cl. 364—900 **4 Claims**



1. An electronic programmer having automatic program selection, comprising:

memory means for storing a plurality of instruction programs;

selecting means responsive to an input signal for automatically successively selecting respective ones of the stored instruction programs during the duration of the input signal;

first switching means for applying an input signal to said selecting means to implement successive selection of the stored programs;

read-out means responsive to an input signal and cooperative with said memory means and said selecting means for reading out the instructions comprising a selected program;

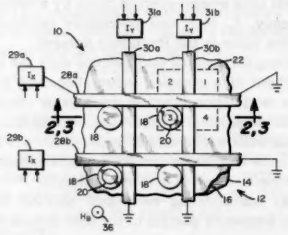
second switching means for applying an input signal to said read-out means to implement read-out of the selected program; and

display means cooperative with said selecting means and said read-out means for displaying which programs are successively selected during program selection and for continually displaying which of the plurality of programs has been selected after program selection has been completed and for displaying which of the program instructions is being read out.

4,114,191
BUBBLE DOMAIN STRUCTURING IN BUBBLE DOMAIN MEMORY PLANE

Roger Edward Lund, Woodbury, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 11, 1977, Ser. No. 786,316
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—2 **4 Claims**



2. A bubble domain memory plane, comprising:

a non-magnetic substrate;

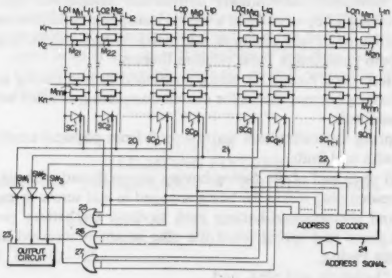
a layer of magnetizable material formed upon said non-magnetic substrate in a matrix array of confinement areas each of which is capable of sustaining bubble domains, said confinement areas surrounded by said layer of magnetizable material which is incapable of sustaining bubble domains; and,

a parallel set of X drive lines and an orthogonally oriented, insulatively superposed parallel set of Y drive lines forming a memory area at each X, Y drive line intersection, each memory area having four corner oriented quadrants for positioning only one of said confinement areas in only a like oriented one of the four quadrants of each of said memory areas.

4,114,192
SEMICONDUCTOR MEMORY DEVICE TO REDUCE PARASITIC OUTPUT CAPACITANCE

Yasoji Suzuki, Ayase, and Kiyofumi Ochii, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,663
Claims priority, application Japan, Mar. 16, 1976, 51-28521
Int. Cl.[2] G11C *7/06*
U.S. Cl. 365—189 **4 Claims**

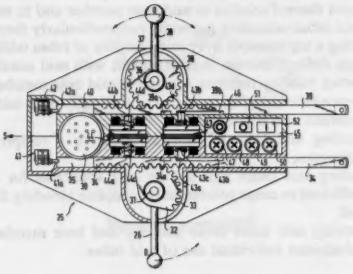


1. In a semiconductor memory device for reading data from and writing data into memory cells comprising storing means formed of a plurality of substantially identical memory cells arranged in a single matrix array with output data lines connected to the plurality of memory cells, sensing means including a plurality of first data-sensing circuits each connected to an output data line of the storing means to detect output data from the memory cells, and a master output line coupled to the output terminals of said first data-sensing circuits, the improvement comprising means for reducing parasitic capacitance affecting said master output line including the first data-sensing circuits being divided into a plurality of groups and the outputs of the first data-sensing circuits of the respective groups being connected together to permit the data detected by said first data-sensing circuits to be transferred to said master output line at a higher speed, said sensing means further including a plurality of second data-sensing circuits respectively connected between said master output line and the groups of outputs of said first data-sensing circuits, and control circuit means for selectively supplying an energizing signal to each said first data-sensing circuit one at a time and for selectively sending forth a control signal to the one second data-sensing circuit connected to that group of first data-sensing circuits to which the then selectively energized first data-sensing circuit belongs.

4,114,193
DEVICE FOR THE CONTROL OF CONCRETE MANUFACTURE IN TRUCK CONCRETE MIXERS

Gerhard Hudelmaier, Frauenstrasse 22, 7900 Ulm, Donau, Germany

Filed Apr. 23, 1976, Ser. No. 679,716
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1975, 2518084
Int. Cl.² B28C *7/02*
U.S. Cl. 366—2 **27 Claims**

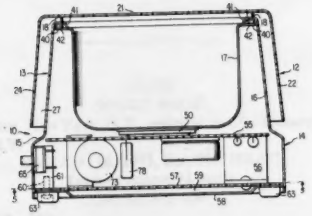


1. A system to control the production of concrete in a concrete mixer truck which is loadable at a loading station and movable to another location such as a job site, said truck being equipped with a rotating drum and drive means for said drum, characterized by a control system including a time switch means for positively keeping said drive means for the drum in operation for a certain predetermined interval of mixing time, said control system comprising a first portion which is mounted at the loading station, and a second portion which is mounted on said concrete mixer truck and coupling means for releasably coupling said first and second portions.

4,114,194
ULTRASONIC CLEANER

Henry J. Walter, Wilton, Conn., assignor to Clairol, Inc., New York, N.Y.

Continuation of Ser. No. 679,409, Apr. 22, 1976, abandoned.
This application Aug. 12, 1977, Ser. No. 824,239
Int. Cl.² B01F *11/02*
U.S. Cl. 366—111 **8 Claims**



1. An ultrasonic cleaner for cleaning relatively small articles comprising:

a metallic receptacle for containing a liquid in which articles to be cleaned are immersed, said receptable having an open top periphery;

ultrasonic transducer means secured to the bottom of the receptacle and a power circuit including a relatively high power transducer driving circuit for the ultrasonic transducer means;

a lower housing portion containing the power circuit and ultrasonic transducer means;

an upper housing portion having a cross-sectional area less than that of the lower housing portion and joined to the lower housing portion by a peripherally extending shoulder, said upper housing portion extending above the lower housing portion to a height greater than the height of the receptacle, said upper housing portion containing the receptable therein and having a top rim which fits over the top periphery of the receptacle to define a top opening into the receptacle;

a cover having an open end and a cross-sectional area greater than the upper housing portion and having a depth slightly less than the height of the upper housing portion, wherein the cover slides over the upper housing portion and substantially surrounds the upper housing portion when in place;

means defining spaced projections disposed around said rim of said upper housing portion, wherein said means holds said cover in spaced relation with respect to said rim when the cover is in place over the upper housing portion;

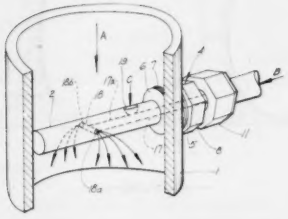
a magnet secured to the cover adjacent the open end thereof; and

a low-power magnetic reed switch which is positioned adjacent said shoulder so that when said cover is in place over the upper housing portion, the magnet will close the magnetic reed switch and thereby allow said power circuit to energize said ultrasonic transducer means to operate the ultrasonic cleaner.

4,114,195
FLUID INJECTOR

Robert S. Dirksing, and Estel R. Todd, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 25, 1977, Ser. No. 845,064
Int. Cl.² B01F *5/12*
U.S. Cl. 366—167 **12 Claims**



1. A fluid injector for the introduction, dispersion and mixing of a first fluid into a second fluid flowing through a conduit, said fluid injector comprising an elongated body mounted in fluid tight fashion through an aperture in the side of said conduit with a first portion and first end of said body located within said conduit and a second portion and second end of said body located exteriorly of said conduit, said first portion of said body extending transversely of the interior of said conduit and transversely of said flow of said second fluid therein, said injector body having a bore extending axially thereof from said second body end and connectable at said second body end to a source of said first fluid under pressure said axial bore communicating with at least one outlet bore extending transversely of said injector body and located within said conduit near the center thereof, said injector body having a transverse inlet bore within said conduit, one end of said inlet bore facing said flow of said second fluid within said conduit and the other end of said inlet bore communicating with said axial bore of said injector body ahead of said at least one outlet bore, whereby a portion of said second fluid enters said inlet bore of said injector and is conducted to said axial bore of said injector to mix therein with said first fluid, the mixture being

ejected into the flow of second fluid within the conduit through the at least one injector outlet bore.

4,114,196

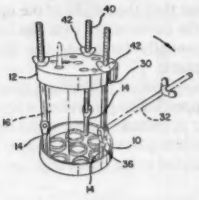
METHOD FOR TINTING CAULK

Rollie Lostutter, 4340 Poplar Creek Rd., Vandalia, Ohio 45377

Division of Ser. No. 756,784, Jan. 5, 1977. This application Feb. 6, 1978, Ser. No. 875,522

Int. Cl.[2] B01F 3/10

U.S. Cl. 366—348 **3 Claims**



1. A method of tinting caulk wherein said caulk has been prepackaged in cylindrical caulking tubes having a removable piston in one end and a fixed nozzle extending from an opposite end, wherein the steps comprise:

removing said piston from said one end of each said caulking tube;

inserting in each of said tube a predetermined amount of tint sufficient to tint all of the caulk in each said tube to the desired color;

replacing said piston in each said one end of said tubes;

mounting a plurality of said tint containing tubes on a base member having positioning means for engagement with said one end of said tubes so as to prevent lateral movement thereof relative to said base member and to maintain said tubes extending generally perpendicularly therefrom;

placing a top member over said plurality of tubes with openings defined therein in engagement with said nozzles;

securing said top member relative to said base member with removable securing means so as to rigidly hold said tubes between said top and base members;

mounting said top and base members to a reciprocating apparatus;

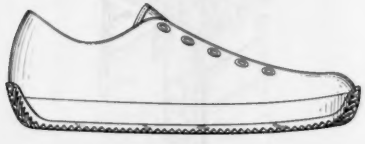
agitating said caulk and tint on said apparatus for a time sufficient to cause substantially complete blending thereof; and

removing said tubes from said top and base members for subsequent individual use of said tubes.

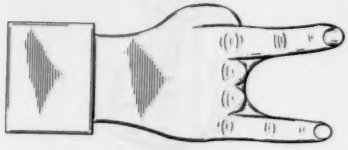
249,296
SHIRT OR SIMILAR ARTICLE
David Friedman, 22, Gush Etzion St., Givatayim, Israel
Filed Aug. 4, 1976, Ser. No. 711,523
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—215

249,297
CARPENTER'S APRON
George Hillinger, Hollywood, Calif., assignor to Action Leathercraft, Inc., Calif.
Filed Nov. 29, 1976, Ser. No. 745,873
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—229

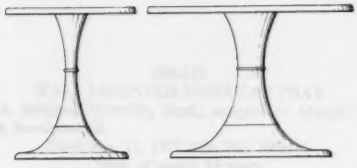
249,298
SPORT SHOE
Jonas Senter, New York, N.Y., assignor to Citc Industries, New York, N.Y.
Filed Apr. 16, 1975, Ser. No. 568,653
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



249,299
BOOT JACK
Robert D. Lindley, 4808 Maplewood, Wichita Falls, Tex. 76308
Filed Jun. 17, 1976, Ser. No. 697,022
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—378.2



249,300
TABLE OR SIMILAR ARTICLE
Arpad Szabo, 5150 MacDonald Ave., Montreal, Quebec, and Ludovic Perl, 781 100th Ave., Chomedey (Laval), Quebec, both of Canada
Filed Oct. 20, 1976, Ser. No. 734,260
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

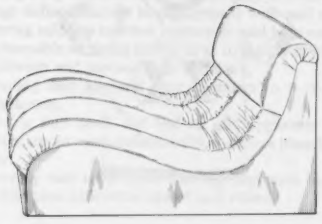


249,301
DISPLAY RACK
Udell S. Ehrlich, 157 Amherst Pl., Atlanta, Ga. 30327
Filed Aug. 6, 1976, Ser. No. 712,314
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—28

249,302
CHAIR OR SIMILAR ARTICLE
Fred Ruf, Arlesheim, Switzerland, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed Aug. 16, 1976, Ser. No. 714,955
Claims priority, application Switzerland, Mar. 25, 1976, 76/62766
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

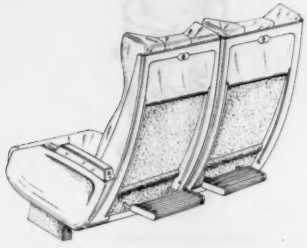
249,303
CHAIR OR SIMILAR ARTICLE
Fred Ruf, Arlesheim, Switzerland, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed Aug. 16, 1976, Ser. No. 714,956
Claims priority, application Switzerland, Mar. 23, 1976, 76/62766
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

249,304
LOUNGE OR SIMILAR ARTICLE
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Nov. 26, 1976, Ser. No. 745,350
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

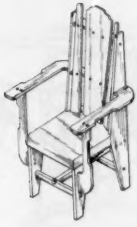


249,305
COLLAPSIBLE TABLE AND CHAIR COMBINATION
Ralph W. Henninger, 3292 Trinity St., Fortuna, Calif. 95540
Filed Sep. 10, 1976, Ser. No. 721,962
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—42

249,306
COMBINED DUAL RAILROAD PASSENGER SEAT AND LEGRESTS
Robert J. Bengtsson, Colorado Springs, Colo., assignor to AMI Industries Inc., Colorado Springs, Colo.
Filed Aug. 10, 1976, Ser. No. 713,125
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48



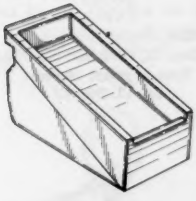
249,307
ARM CHAIR
Thomas M. Hall, 139 W. North St., Ilion, N.Y. 13357
Filed Jul. 9, 1976, Ser. No. 690,248
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

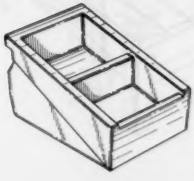


249,308
RECESSED PAPER ROLL HOLDER AND DISPENSER COMBINATION
James A. Williams, 4120 Morning Pl., Sarasota, Fla. 33581
Filed May 23, 1977, Ser. No. 799,731
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97

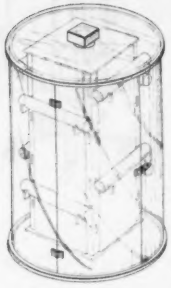
249,309
COMBINED PAPER ROLL DISPENSER AND HOLDER
James A. Williams, 4120 Morning Pl., Sarasota, Fla. 33581
Filed May 23, 1977, Ser. No. 799,732
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—97

249,310
WALL MOUNTED MODULAR TRAY
John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Incorporated
Filed Jan. 17, 1977, Ser. No. 760,076
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—136

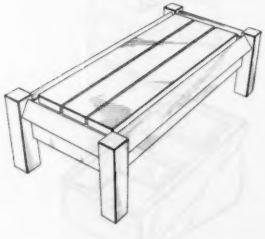




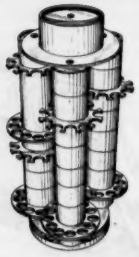
249,311
JEWELRY DISPLAY CASE
Hayden W. Coulthurst, Warwick, R.I., assignor to Sweet Manufacturing Company
Filed Aug. 15, 1977, Ser. No. 824,843
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—146



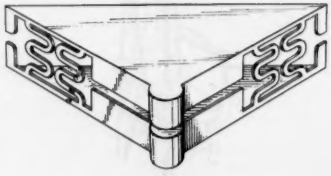
249,312
TABLE
William F. Taber, 3520 Albans, Houston, Tex. 77005
Filed Dec. 22, 1976, Ser. No. 753,457
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



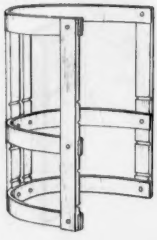
249,313
JEWELRY DISPLAY SUPPORT, OR SIMILAR ARTICLE
Victor W. Ganz, 393 Fifth Ave., New York, N.Y. 10016
Filed Sep. 30, 1977, Ser. No. 838,122
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—188



249,314
CORNER PROTECTORS
Melvyn Wilde, 21 Lime Grove, Lowton, Warrington, Cheshire, and Robert John Sutton, 50 Westbourne Rd., Birkdale, Southport, Lancashire, both of England
Filed Nov. 9, 1976, Ser. No. 740,177
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

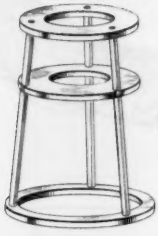


249,315
FRAME FOR A CHAIR
J. Chr. H. Daae-Qvale, Skodje, Norway, assignor to Möre Lenestolfabrikk A/S, Orsta, Norway
Filed Nov. 11, 1976, Ser. No. 741,162
Claims priority, application Norway, May 12, 1976, 7657484
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

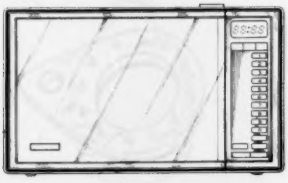


249,316
DRINKING CUP
Elizabeth Anne Tyska, 169 Bergen Ave., Ridgefield Park, N.J. 07660, and Margaret Semple Rooney, Lakeside Park, N. Windham, Me. 04062
Filed May 2, 1977, Ser. No. 793,185
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9

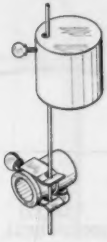
249,317
BOTTLE DRAINER STAND
F. Karl Korn, 1634 8th Ave. N., Fort Dodge, Iowa
Filed Nov. 4, 1976, Ser. No. 738,656
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—70



249,318
MICROWAVE OVEN
Clarence F. Graser, 2654 Charing Rd., Columbus, Ohio 43221, and Arthur F. Ludvigsen, 3201 Skyview Dr., Burnsville, Minn. 55337
Filed Jan. 31, 1977, Ser. No. 764,435
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



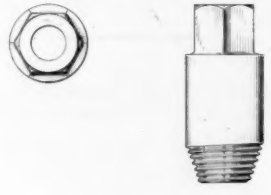
249,319
ROTISSERIE COUNTERBALANCE
Leslie G. Dutchburn, 7 De Vere Gardens, Toronto, Ontario, Canada
Filed Mar. 14, 1977, Ser. No. 777,248
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—129



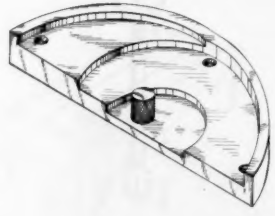
249,320
SPOON OR SIMILAR ARTICLE OF FLATWARE
Ben Seibel, New York, N.Y., assignor to Oxford Hall Silversmiths, Ltd., New York, N.Y.
Filed Aug. 18, 1976, Ser. No. 715,480
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

249,321
NOVELTY SPOON
Anthony J. Mancini, 893 S. Green Rd, South Euclid, Ohio 44121
Filed Oct. 26, 1976, Ser. No. 735,590
Term of patent 3 years
Int. Cl. D7—*03*
U.S. Cl. D7—143

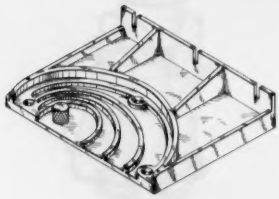
249,322
TRANSMISSION SEAL REMOVER
Walter L. Diffenderfer, Lancaster, Pa., assignor to K-D Manufacturing Company, Lancaster, Pa.
Filed Jan. 20, 1976, Ser. No. 650,606
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14



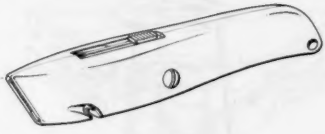
249,323
JAR OPENER
Howard A. Hutson, P.O. Box 1415, Denver, Colo. 80201
Filed Sep. 13, 1976, Ser. No. 722,633
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—37



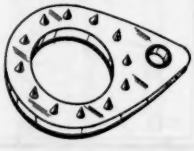
249,324
JAR OPENER
Howard A. Hutson, 779 Kinnikinnik Hill, Golden, Colo. 80401
Filed Sep. 13, 1976, Ser. No. 722,642
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—37



249,325
UTILITY KNIFE
Ernest James Rollband, Brooktondale, N.Y., assignor to The Stanley Works, New Britain, Conn.
Filed Sep. 8, 1975, Ser. No. 613,037
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



249,326
THIMBLE FOR A ROPE
Bengt Ingemar Jöhanson, Kullavägen 7, Sjomarken, Sweden (510 41)
Filed Oct. 20, 1976, Ser. No. 734,029
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367



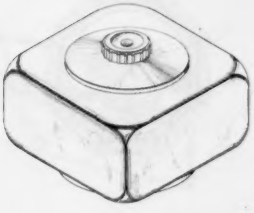
249,327
SWIVEL SWAG HOOK
Stanley Gaines, Roslyn Heights, N.Y., assignor to Allen-Stevens Corp., Woodside, N.Y.
Filed Jan. 24, 1977, Ser. No. 762,032
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

249,328
DISPENSING BOTTLE
Robert E. Fields, P.O. Box 268, Cedarhurst, N.Y. 11516
Filed Oct. 15, 1976, Ser. No. 732,680
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—30

249,329
BOTTLE
Louis Schacher, and Esther Schacher, both of 4910 Fifteenth Ave., Brooklyn, N.Y. 11219
Filed Jul. 21, 1976, Ser. No. 707,227
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—45

249,330
BOTTLE
Jacques Pigeon, Chalon-sur-Saone, France, assignor to Carnaud Total Interplastic
Filed Dec. 16, 1976, Ser. No. 751,460
Claims priority, application France, Jun. 16, 1976, 76 121
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—119

249,331
CONTAINER FOR LIQUIDS
Guy Hubert, Lasne-Chapelle Saint Lambert, and Charles Vandenhove, Vilvoorde, both of Belgium, assignors to Societe Bourguignonne d'Applications Plastiques, Chevigny-Saint-Sauveur, France
Filed Feb. 27, 1976, Ser. No. 662,087
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—175



249,332
CASE FOR A DRY SHAVER
Karl Peter Gunter Hauf, Klagenfurt, Viktring, Austria, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jun. 7, 1976, Ser. No. 693,489
Claims priority, application Benelux, Dec. 12, 1975, 5073400
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D9—186

249,333
CANDY DISPENSER
Walter Stern, Wilmette, Ill., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jun. 7, 1976, Ser. No. 693,399
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193

249,334
WALL CLOCK
James E. Watt, 41 N. Terrace Dr., Tiburon, Calif. 94920, and Richard B. Moore, 240 Bay St. Apt. No. 209, San Francisco, Calif. 94133
Filed Nov. 18, 1976, Ser. No. 742,892
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—21

249,335
COMBINED THERMOMETER AND HYGROMETER OR THE LIKE
Aijiro Kaneko, Hanyu, Japan, assignor to Kaneko Agricultural Machinery Co., Ltd., Hanyu, Japan
Filed Aug. 26, 1976, Ser. No. 718,036
Claims priority, application Japan, May 17, 1976, 51-18252
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—53

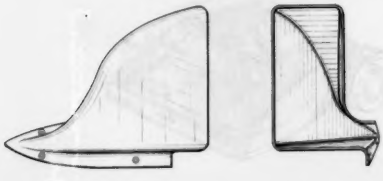
249,336
SPORTS NET HEIGHT GAUGE
Nina H. Webb, 5 Stephanie La., South, Darien, Conn. 06820
Filed Oct. 6, 1976, Ser. No. 725,921
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—70

249,337
EARRING
Russell A. DiOrio, Cranston, R.I., assignor to DiOrio Enterprises, Inc.
Filed Sep. 21, 1976, Ser. No. 725,253
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—40

249,338
JEWELRY FINDING OR THE LIKE
Anita M. Spinelli, 9150 E. Sellarole, Tucson, Ariz. 85710
Filed Mar. 17, 1977, Ser. No. 778,447
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—54

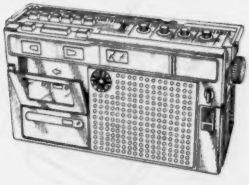
249,339
PENDANT
Hayden William Couithurst, Warwick, R.I., assignor to McGrath-Hamin, Inc.
Filed Sep. 27, 1976, Ser. No. 727,389
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—79

249,340
COVER FOR A VEHICLE MIRROR HOUSING
Dennis G. Braid, 5647 Oakdale Ave., Woodland Hills, Calif. 95695
Filed Sep. 13, 1976, Ser. No. 723,186
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—187

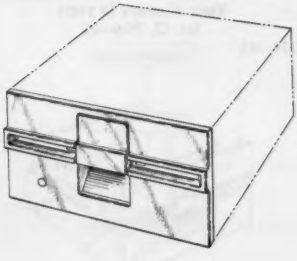


249,341
ELECTRO-MECHANICAL PULSER
William C. Mertz, Webster Groves, Mo., assignor to UMC Industries, Inc., Stamford, Conn.
Filed Nov. 11, 1976, Ser. No. 741,055
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32

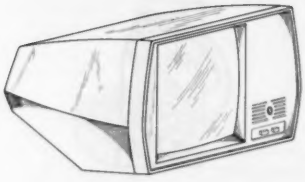
249,342
CASSETTE TAPE RECORDER
Mitsugu Ohki, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 12, 1976, Ser. No. 676,204
Claims priority, application Japan, Oct. 14, 1975, 50-41258
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6



249,343
FRONT PANEL OF A FLEXIBLE DISK DRIVE
Peter A. Ronzani, Saratoga, Calif., assignor to Shugart Associates, Sunnyvale, Calif.
Filed Oct. 18, 1976, Ser. No. 733,147
Term of patent 14 years
Int. Cl. D13—*03;* D14—*02*
U.S. Cl. D14—40

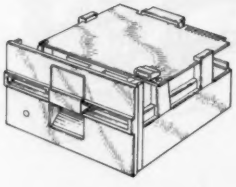


249,344
CATHODE-RAY TUBE CONSOLE
Clarence D. Zierhut, Richardson, Tex., assignor to Mohawk Data Sciences Corp.
Filed Nov. 15, 1976, Ser. No. 742,032
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—43

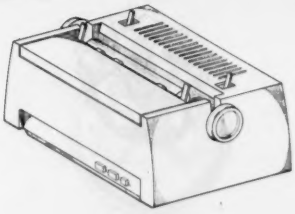


249,345
SELF-CONTAINED, PORTABLE DATA ENTRY TERMINAL OR THE LIKE
Melvin M. Oliveira, Huntington Beach, and Joseph A. Weidinger, Anaheim, both of Calif., assignors to MSI Data Corporation, Costa Mesa, Calif.
Filed Jul. 13, 1977, Ser. No. 815,258
Term of patent 14 years
Int. Cl. D14—*02*; D18—*01*
U.S. Cl. D14—43

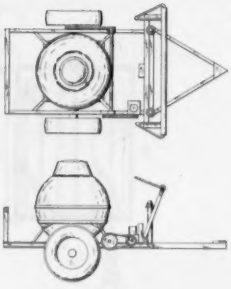
249,346
FLEXIBLE DISK DRIVE
Albert S. Chou, Monte Sereno; David A. Brown, Saratoga; Donald V. Daniels, Santa Cruz; Harold C. Medley, Los Gatos; Peter A. Ronzani, Saratoga, and Ray Y. Yokoyama, Sunnyvale, all of Calif., assignors to Shugart Associates, Sunnyvale, Calif.
Filed Oct. 19, 1976, Ser. No. 733,785
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—46



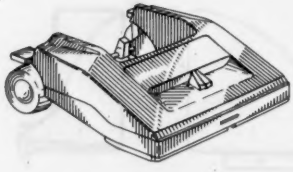
249,347
PRINTER CABINET
Clarence D. Zierhut, Richardson, Tex., assignor to Mohawk Data Sciences Corp.
Filed Dec. 16, 1976, Ser. No. 752,639
Term of patent 14 years
Int. Cl. D14—*02*; D18—*02*
U.S. Cl. D14—50



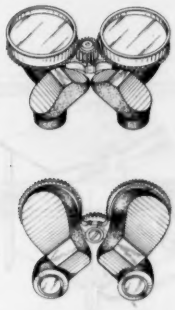
249,348
AGRICULTURAL SPRAYING IMPLEMENT
William Felix Hughes, 73 Abernathy Rd., Belmont, Western Australia, Australia (48013)
Filed May 12, 1977, Ser. No. 796,207
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—13



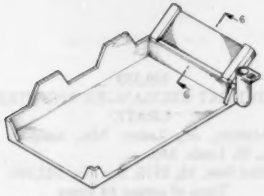
249,349
SUCTION CLEANER NOZZLE OR THE LIKE
Richard A. Wareham, 2315 Schneider Rd., NE., North Canton, Ohio 44720
Filed Jan. 3, 1977, Ser. No. 756,076
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—63



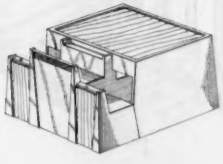
249,350
BINOCULAR
William J. Beecher, c/o The Chicago Academy of Sciences, 2001 N. Clark St., Chicago, Ill. 60614
Filed Apr. 7, 1976, Ser. No. 674,593
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—59



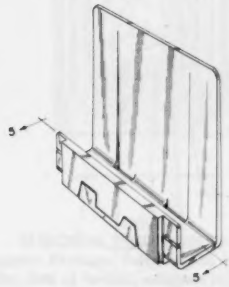
249,351
COMBINED MEMO PAD HOLDER, CALENDAR HOLDER AND PEN HOLDER, OR THE LIKE
Lawrence C. Mattera, 2828 Upshube St., #212, San Diego, Calif. 92106
Filed Feb. 11, 1977, Ser. No. 767,890
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—22



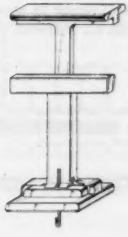
249,352
TAPE DISPENSER
Kenneth J. Kirchhoff, Vadnais Heights, Minn., assignor to Minnesota Mining & Manufacturing Company
Filed Dec. 23, 1976, Ser. No. 754,080
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—69



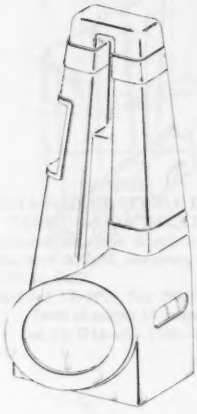
249,353
DESK TOP LETTER FILE
David A. Juergens, and Greg P. Terek, both of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Sep. 17, 1976, Ser. No. 724,476
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—90



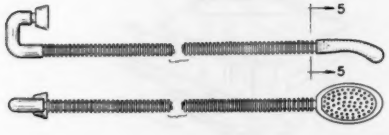
249,354
FISH HOOK REMOVER
Rayburn J. Campbell, 1715 Winnie St., Apt. 2, Galveston, Tex. 77550
Filed Feb. 26, 1976, Ser. No. 661,795
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—31



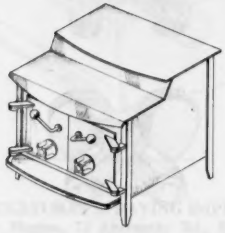
249,355
TOILET TANK CHEMICALS DISPENSER
Elliott E. Blank, San Anselmo, Calif., assignor to Shell Oil Company, Houston, Tex.
Filed Feb. 22, 1977, Ser. No. 770,979
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



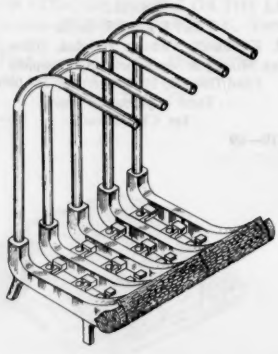
249,356
SHAMPOO UNIT FOR SINK SPOUT OR THE LIKE
Joseph Nagy, 1513 Sherwood Ct., Dearborn, Mich. 48124
Filed Nov. 1, 1976, Ser. No. 737,290
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



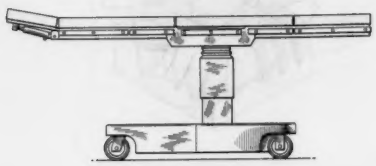
249,357
COMBINATION HEATING AND COOKING STOVE
William L. DeMarco, Cemetery Rd., Great Meadows, N.J. 07838
Filed Dec. 30, 1977, Ser. No. 866,145
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—*97*

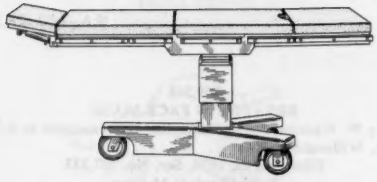


249,358
COMBINED HEAT EXCHANGER AND FIREPLACE GRATE
Richard W. Mellow, Jr., Ladue, Mo., assignor to Liberty Foundry Co., St. Louis, Mo.
Filed Nov. 18, 1976, Ser. No. 742,901
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—93

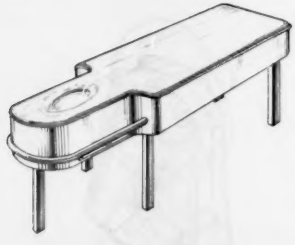


249,359
OPERATING TABLE
Michael James Forster Stott, Bromma, and Bengt Häger, Täby, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden
Filed May 19, 1976, Ser. No. 687,828
Claims priority, application Sweden, Nov. 24, 1975, 752330
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—3

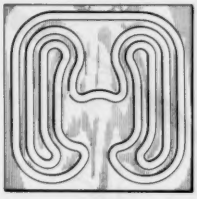




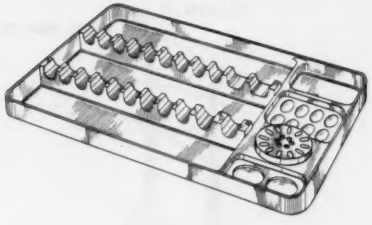
249,360
THERAPY TABLE
Frederic V. Lacock, 240 Woodland, Barrington, Ill. 60010
Filed Dec. 30, 1976, Ser. No. 755,617
Term of patent 14 years
Int. Cl. D24—*01;* D6—*03*
U.S. Cl. D24—3



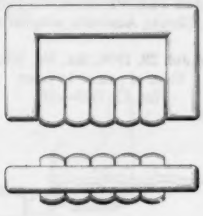
249,361
MODULAR TRACK ASSEMBLY FOR 150-UNIT BIOLOGICAL SAMPLER CHANGER
Anthony A. Mueller, Florence, Ky., assignor to Actus, Inc., Florence, Ky.
Filed Jul. 12, 1977, Ser. No. 815,008
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—7



249,362
SURGICAL INSTRUMENT TRAY
Tore Alexander Forsman, Saltsjöbaden, and Christer Odvik, Djursholm, both of Sweden, assignors to Toringe Consult AB and Christer Odvik AB
Filed Apr. 6, 1978, Ser. No. 674,277
Claims priority, application Sweden, Oct. 7, 1975, 2014/75
Term of patent 14 years
Int. Cl. D24—*02, 99*
U.S. Cl. D24—31

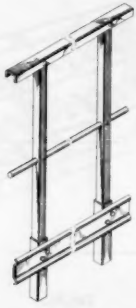


249,363
BODY TONER
Maureen Day, 45 E. Walnut St., Pasadena, Calif. 91103
Filed Oct. 26, 1976, Ser. No. 735,148
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—36



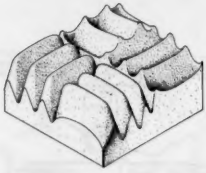
249,364
SURGICAL APPLICATOR SWAB
Robert P. Julius, New York, N.Y., assignor to Nice-Pak Products, Inc., Mt. Vernon, N.Y.
Filed Jul. 18, 1977, Ser. No. 816,520
Term of patent 14 years
Int. Cl. D24—*02, 04*
U.S. Cl. D24—63

249,365
PLASTIC GUARD RAIL OR THE LIKE FOR WALKWAYS, BALCONIES, PLATFORMS AND THE LIKE
H. Frederick Lange, Hollins, Va., assignor to Structural Plastic Systems, Inc., Fincastle, Va.
Filed Oct. 22, 1976, Ser. No. 734,759
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—44

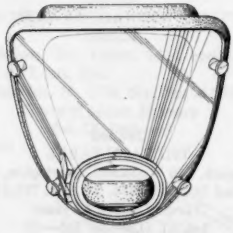


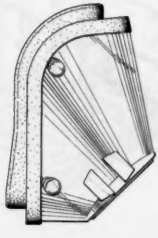
249,366
SCREEN DOOR PERIPHERAL FRAME MEMBER
Harold Rex Jury, Glynde, Australia, assignor to Ampliform Pty Limited
Filed Jul. 29, 1976, Ser. No. 709,766
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—76

249,367
DECORATIVE ACOUSTICAL PANEL
Larrie S. Reese, Saint Paul, Minn., assignor to Charles Industries Corporation, Minneapolis, Minn.
Filed Sep. 11, 1975, Ser. No. 612,288
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—92

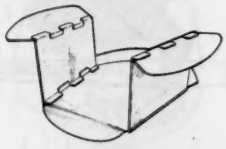


249,368
BREATHING FACE MASK
Dudley W. Watkins, Jr., Williamsville, N.Y., assignor to A-T-O Inc., Willoughby, Ohio
Filed Jul. 21, 1976, Ser. No. 707,233
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D29—9

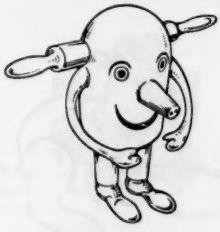




249,369
FOLDABLE ADAPTER FOR A WATER CLOSET FOR USE BY A PET ANIMAL
Jan G. L. S. Kullenbäck, c/o Johansson, Underasgatan 4, S-412 51, Göteborg, Sweden
Filed Sep. 23, 1975, Ser. No. 616,047
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99



249,370
DOLL
John B. Salt, and David J. Salt, both of 237 Dickenson Rd., Longsight, Manchester M13 OYW, England
Filed Jan. 11, 1977, Ser. No. 758,411
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

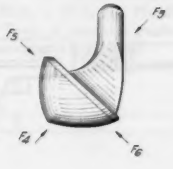


249,371
DOLL
John B. Salt, and David J. Salt, both of 237 Dickenson Rd., Longsight, Manchester M13 OYW, England
Filed Jan. 11, 1977, Ser. No. 763,159
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

249,372
DOLL
John B. Salt, and David J. Salt, both of 237 Dickenson Rd., Longsight, Manchester M13 OYW, England
Filed Jan. 11, 1977, Ser. No. 758,413
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

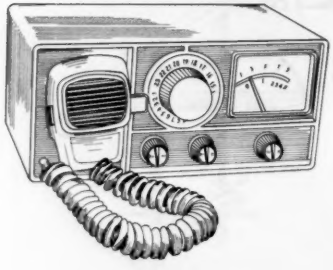
249,373
GOLF CLUB HEAD
Phillipe M. R. A. J. Jeghers, 48 Blvd. Ernest Solvay, 4400 Herstal, Belgium
Filed Aug. 31, 1976, Ser. No. 719,242
Claims priority, application Belgium, Mar. 3, 1977, 50,890-01
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

249,374
GOLF CLUB HEAD
Phillipe M. R. A. J. Jeghers, 48 Blvd. Ernest Solvay, 4400 Herstal, Belgium
Filed Aug. 31, 1976, Ser. No. 719,258
Claims priority, application Belgium, Mar. 3, 1977, 50,890-02
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



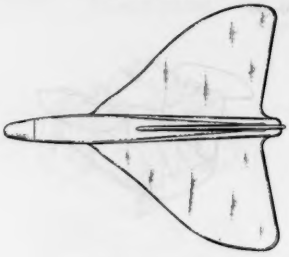
249,375
PHYSICAL EXERCISER FOR MOUNTING ON BED
Frederick W. Deppner, Jr., 9708 Lamar Ave., Overland Park, Kans. 66207
Filed Oct. 12, 1976, Ser. No. 731,751
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K

249,376
TOY CB RADIO
Beverly W. Taylor, Gasconade County, Mo., assignor to Steven Manufacturing Company, Hermann, Mo.
Filed Jun. 14, 1976, Ser. No. 696,064
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C



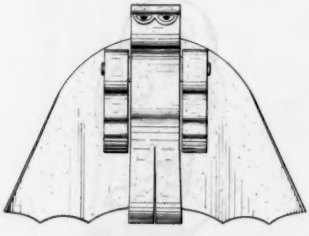
249,377
TOY AIRPLANE LAUNCHER
Albert T. Takahashi, 2819 Danaha St., Torrance, Calif. 90505
Filed Sep. 13, 1976, Ser. No. 722,734
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 PP

249,378
TOY AIRPLANE
Albert T. Takahashi, 2819 Danaha St., Torrance, Calif. 90505
Filed Sep. 13, 1976, Ser. No. 722,735
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



249,379
TOY KANGAROO
Catherine M. Barton, East Aurora, and James E. Slowe, South Wales, both of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 29, 1976, Ser. No. 736,835
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B

249,380
TOY FIGURE GLIDER
Joseph J. Wetherell, Bedford, N.Y., assignor to Ned Strongin Associates, Inc., New York, N.Y.
Filed Jan. 19, 1977, Ser. No. 760,282
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AD

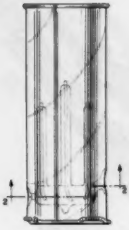


249,381
TOY ISLAND
Robert D. Wise, 1437 W. Exchange, Akron, Ohio 44313
Filed Feb. 17, 1977, Ser. No. 769,553
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

249,382
TOY ICEBERG
Robert D. Wise, 1437 W. Exchange, Akron, Ohio 44313
Filed Feb. 17, 1977, Ser. No. 769,554
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R

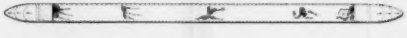
249,383
GAME PADDLE
Anthony J. Mancini, 893 S. Green Rd., South Euclid, Ohio 44121
Filed Mar. 21, 1977, Ser. No. 779,818
Term of patent 3 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 P

249,384
COMBINED CANDLES AND CONTAINER THEREFOR
Willy H. Vanbragt, 111 Rengstorff #92, Mountain View, Calif. 94040
Filed Feb. 10, 1977, Ser. No. 767,472
Term of patent 7 years
Int. Cl. D26—*01*
U.S. Cl. D48—2



249,385
PROTECTIVE GUARD FOR AN UNDERWATER POOL LIGHT
Dale C. Delphia, Modesto, Calif., assignor to Blue Dolphin Pools of Modesto, Modesto, Calif.
Filed Aug. 17, 1977, Ser. No. 825,269
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 B

249,386
GUITAR STRAP
Randall S. Zacuto, 913 Pico Blvd., Santa Monica, Calif. 90405
Filed Mar. 1, 1976, Ser. No. 662,506
Term of patent 14 years
Int. Cl. D17—*99*
U.S. Cl. D56—1 R



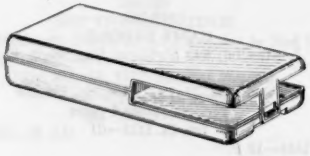
249,387
FOLDING VIOLIN
John F. Hart, 1004 W. Pawnee St., Cleveland, Okla. 74020
Filed Aug. 24, 1976, Ser. No. 717,450
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A

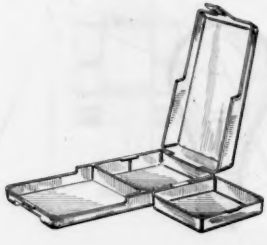
249,388
CALCULATOR CASING
Eugene Joseph Sulek, Richardson, and William James Lawrence, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Sep. 2, 1976, Ser. No. 720,166
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

249,389
VISITING CARD HOLDER FITTING FOR A PRINTING MACHINE
Kazumasa Nagai, Hiroshima, Japan, assignor to Ryobi Ltd., Fuchu, Japan
Filed Feb. 8, 1977, Ser. No. 766,820
Claims priority, application Japan, Aug. 17, 1976, 51/32549
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 R

249,390
ELECTRONIC CALCULATING MACHINE
Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 7, 1977, Ser. No. 804,432
Claims priority, application Japan, Dec. 16, 1976, 51-49149
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

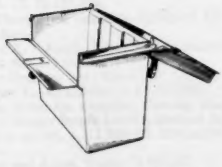
249,391
TRAVEL CASE FOR AN ELECTRIC DRY SHAVER
Jacob A. Krapowicz, Ridgefield, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.
Filed Jan. 12, 1976, Ser. No. 648,374
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



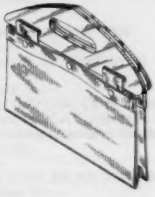


249,392
CARRYING CASE WITH ADJUSTABLE CARRYING STRAPS
Joseph Y. Pelavin, North Bergen, N.J., assignor to Lark Luggage Corporation
Filed Oct. 29, 1976, Ser. No. 737,139
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—1 R

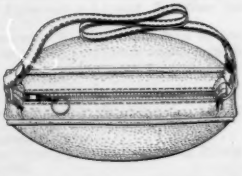
249,393
FILE BOX
Ole Winther, Helsingor, Denmark, assignor to Esselte Obergs AB, Stockholm, Sweden
Filed Oct. 27, 1976, Ser. No. 735,937
Claims priority, application Sweden, May 5, 1976, 760992
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



249,394
HANDBAG
Lawrence B. Schwartz, Fairfield, Conn., assignor to Acricite Company, Inc., Bridgeport, Conn.
Filed Nov. 3, 1976, Ser. No. 738,551
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F



249,395
HANDBAG
Laura J. Kling, 2030 Amherst Road NE., Massillon, Ohio 44646
Filed Oct. 8, 1976, Ser. No. 730,705
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 C



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF SEPTEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Sundman, Frey Viking, 4,112,587, Cl. 34-12.000.

A. E. Staley Manufacturing Company: *See*—
Hurst, Thomas L., B 750,332, Cl. 195-31.00F.

A. L. Lee Corporation: *See*—
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A.M. Liaaen A/S: *See*—
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A. O. Smith Corporation: *See*—
Cook, Robert E., B 789,643, Cl. 204-197.000.

A. Schild S.A.: *See*—
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Aaltonen, Olavi August; and Juusela, Jyrki Tapani, to Outokumpu Oy. Process for suspension smelting of finely-divided sulfidic and/or oxidic ores or concentrates. B 647,506, Cl. 75-74.000.

AB Ziristor: *See*—
Pupp, Herwig; and Andersson, Otto Birger, B 777,940, Cl. 206-606.000.

Abair, Raymond L.; and Kulish, Stanley J., Jr., to Champion Spark Plug Company. Hand held ultrasonic nebulizer. B 784,044, Cl. 261-81.000.

Abbott, Joseph L. Tamper proof container assembly. B 803,624, Cl. 220-276.000.

Abe, Hideo: *See*—
Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, B 720,502, Cl. 209-1.000.

Abe, Kazunobu; Rikimaru, Hiroaki; Yamazaki, Iwao; and Hasegawa, Hiroshi, to Sakai Chemical Industry Co., Ltd. Production of shaped catalysts or carriers comprising titanium oxides. B 753,323, Cl. 252-455.00R.

Abe, Shoichi: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.

Abex Corporation: *See*—
Frank, Earl E.; and Yee, Bing S., B 724,720, Cl. 210-167.000.

Abrarov, Vakif Barievich: *See*—
Latypov, Anvar Latypovich; and Abrarov, Vakif Barievich, 4,112,935, Cl. 128-69.000.

Abts, Leigh Roy, to Rhode Island Hospital. Ultrasonic particulate sensing. 4,112,773, Cl. 73-642.000.

ACF Industries, Incorporated: *See*—
Bond, John A., B 841,225, Cl. 251-328.000.
Reinhardt, James R.; and Scott, Mark P., B 833,947, Cl. 213-43.000.

Ackeret, Peter, to IDN Inventions and Development of Novelties AG. Holders for tape cassettes. B 583,756, Cl. 206-387.000.

Acme Resin Corporation: *See*—
Craig, Robert Simpson, B 694,426, Cl. 428-404.000.

Acricite Company, Inc.: *See*—
Barbareni, Charlotte, 4,112,991, Cl. 150-28.00A.

Adams, Elvin E.; Wells, Tom J.; Wentzek, Horst F.; Zapletal, Henry; and Zugel, Marty J., to Leggett & Platt, Incorporated. Method and apparatus for forming a row of spring coils from a continuous length of wire. 4,112,726, Cl. 72-137.000.

Adams, Robbie J. Therapeutic assembly. 4,112,943, Cl. 128-24.100.

Adcock, James L.: *See*—
Lagow, Richard J.; Adcock, James L.; and Maraschin, Norma J., B 379,876, Cl. 422-191.000.

Advanced Drainage Systems, Inc.: *See*—
Dreibelbis, Logan L., 4,112,810, Cl. 83-490.000.

Affeldt, Karl-Heinz; Fritzsche, Gunther; Ganzke, Joachim; and Raupach, Gerhard, to Robert Bosch GmbH. Method for measuring the blood pressure of a patient. 4,112,929, Cl. 128-2.05M.

Agari, Yujiro: *See*—
Tsuji, Sadahiko; and Agari, Yujiro, B 857,692, Cl. 350-184.000.

Agency of Industrial Science and Technology: *See*—
Chikamori, Kunio, B 833,862, Cl. 204-129.100.
Juichi, Imamura; Masahiko, Takehara; and Kazuhiro, Kizawa, B 657,887, Cl. 260-600.00R.
Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, B 720,502, Cl. 209-1.000.
Suzuki, Hiroshige; Horie, Eizi; and Nagashima, Hideo, 4,112,648, Cl. 52-508.000.

Agfa-Gevaert AG: *See*—
Eppe, Rudolf; Schnall, Gunther; Mullritter, Ludwig; Beck, Johann; and Hartwig, Karl, B 699,341, Cl. 355-8.000.
Huber, Leonhard; Kirschner, Helmut; and Muller, Herbert, B 763,684, Cl. 354-252.000.
Walter, Karl, B 828,971, Cl. 355-75.000.

Agfa-Gevaert, N.V.: *See*—
Smets, Georges Joseph; and Vandensavel, Jean Marie, B 406,350, Cl. 260-308.00D.

Agro-Drip, Incorporated: *See*—
Drossbach, Hubert, B 773,766, Cl. 264-154.000.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Ground fault detecting apparatus including current-responsive threshold detection circuitry. B 751,588, Cl. 324-51.000.

Aikoh Co., Ltd.: *See*—
Yanagioka, Seiichi, B 684,351, Cl. 273-72.00A.

Air Logistics Corporation: *See*—
Stiles, Kenneth M., B 600,202, Cl. 350-96.230.

Air Preheater Company, Inc., The: *See*—
Richmond, Donald Louis, B 862,894, Cl. 55-378.000.

Airco, Inc.: *See*—
Timin, Mitchell E., B 686,778, Cl. 198-339.000.

Aizawa, Hiroshi: *See*—
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Shimizu, Masami; Yoshikawa, Ryoichi; and Aizawa, Hiroshi, B 758,200, Cl. 354-238.000.

Ajinomoto Co., Inc.: *See*—
Gomi, Teruo; Hisa, Yuji; and Soeda, Takahiko, B 790,440, Cl. 260-123.500.

Akado, Hajime; Uchida, Yoshiro; Yamaguchi, Akihide; Nonoyama, Takao; Ootsubo, Suminobu; and Harada, Toshiro, to Nippondenso Co., Ltd. Temperature responsive device for internal combustion engines. 4,112,896, Cl. 123-122.00D.

Akashi, Hiromitsu: *See*—
Itoh, Hiroyuki; Mitsuhashi, Kenhachi; and Akashi, Hiromitsu, 4,112,746, Cl. 73-95.000.

Akiyama, Shinichi; and Yamamoto, Haruhisa, to Nippon Zeon Co. Ltd. Process for preparing unsaturated carboxylic acids. B 777,679, Cl. 562-532.000.

Akiyama, Tomojiro: *See*—
Iwata, Toshiharu; Hattori, Tadashi; Mori, Kouichi; and Akiyama, Tomojiro, 4,112,885, Cl. 123-98.000.

Aktiebolaget Atomenergi: *See*—
Margen, Peter Heinrich Erwin; and Naslund, Rolf Paul, 4,112,569, Cl. 29-157.30R.

Aladdin Industries, Incorporated: *See*—
Frazier, Albert A.; and Phillips, Howard W., B 837,519, Cl. 222-131.000.

Albaric, Jacques E., to Westinghouse Electric Corp. Seal arrangement for a discharge chamber for water cooled turbine generator rotor. B 720,331, Cl. 310-54.000.

Albaric, Jacques E.; Curtis, Little P.; and Dailey, George F., to Westinghouse Electric Corp. Grooved visco seal for stationary discharge chamber of water-cooled turbine generator. B 720,332, Cl. 310-54.000.

Albert Handtmann, Firma: *See*—
Muller, Johann, 4,112,546, Cl. 17-49.000.

Albright & Wilson Ltd.: *See*—
Collins, John D.; and Jones, Trevor E., B 781,118, Cl. 260-429.700.

Alco Standard Corporation: *See*—
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Alcon Laboratories, Inc.: *See*—
Helixon, Michael L.; and Ward, Barry S., 4,112,945, Cl. 128-218.00D.

Alden Research Foundation: *See*—
Bliudnikas, Kestutis E., B 754,904, Cl. 346-139.00C.

Aldridge, Trevor John; Lock, Alan Howard; and Bell, Robert Martin Alistair, to Rolls-Royce Limited. Real-time recording of fatigue damage. 4,112,747, Cl. 73-116.000.

Alegranti, Constance Wright, to Du Pont de Nemours, E. I., and Company. Asymmetric polyimide membranes. B 677,443, Cl. 210-500.00M.

Alexander, Robert: *See*—
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, B 686,496, Cl. 423-512.00A.

Alexander, Robert H.: *See*—
Thackston, Clyde David; and Alexander, Robert H., B 811,423, Cl. 192-150.000.

Alexandrovich, George, to Pickering & Company, Inc. Playback stylus for phonograph record stamper. B 790,391, Cl. 274-37.000.

Alfa-Laval Company Limited: *See*—
Denne, Phillip Raymond Michael; Davies, David Evan Naunton; and McEwen, Colin Dougal, B 723,621, Cl. 343-6.8LC.

All Sunpower, Inc.: *See*—
Skinner, Leon S.; and Taylor, Norman C., 4,112,922, Cl. 126-271.000.

Allen, John D. Fiberglass tank and method for making the same. 4,112,644, Cl. 52-245.000.

Allen, Richard J.: *See—*
DuBosque, Clayton, Jr.; Rudd, Wallace C.; and Allen, Richard J., 4,112,566, Cl. 29-157.30C.

Allied Chemical Corporation: *See—*
Kramer, John B., 4,112,899, Cl. 123-139.0AW.
Pieters, Wim J. M.; and Carlson, Emery J., B 791,767, Cl. 252-438.000.
Russell, William Norman; Bruton, James Isaac; and Twilley, Ian Charles, B 829,764, Cl. 264-210.00F.
Tanner, Lee E.; and Ray, Ranjan, B 823,080, Cl. 75-177.000.

Allis-Chalmers Corporation: *See—*
Williams, Douglas W.; and Kaiser, George E., B 750,918, Cl. 180-51.000.

Allsop, Ivor J. Shoe retaining and carrying device. B 848,098, Cl. 224-45.00S.

Alneri, Enzo; Bottaccio, Giorgio; Campolmi, Stefano; and Cassar, Luigi, to Montedison S.p.A. Process for the preparation of anhydrous solutions of alkaline phenates in organic solvents. B 816,919, Cl. 568-716.000.

Alpern, Marvin: *See—*
Rosenthal, Arthur Lee; Alpern, Marvin; and Meisch, Charles Edward, 4,112,949, Cl. 128-278.000.

Alproco, Inc.: *See—*
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Altman, Eston: *See—*
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Altman, James E.; and Altman, Eston, 4,112,838, Cl. 99-546.000.

Altman, James E.; and Altman, Eston. Holder for fruit and the like. 4,112,837, Cl. 99-537.000.

Altman, James E.; and Altman, Eston. Halving and calyx removing apparatus for pears and the like. 4,112,838, Cl. 99-546.000.

Altman, Richard M., to Vivitar Corporation. Reflex camera with internal zoom lens. B 674,229, Cl. 354-152.000.

Amagami, Keizo: *See—*
Kiuchi, Mitsuyuki; Amagami, Keizo; Maeda, Shigeru; and Saegusa, Shigeharu, B 764,983, Cl. 219-10.49R.

AMAX Inc.: *See—*
Buker, Donald O., B 768,386, Cl. 75-211.000.

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Yoshikawa, Yoshio; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, B 751,668, Cl. 252-428.000.

American Can Company: *See—*
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Schlesinger, Sheldon I., B 658,207, Cl. 96-115.00P.
Watt, William R.; Astolfi, Edmund G.; and Laufer, Jay K., B 743,133, Cl. 427-44.000.

American Cyanamid Company: *See—*
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., B 706,087, Cl. 526-258.000.
Weiss, Martin Joseph, B 767,863, Cl. 560-121.000.

American Home Products Corporation: *See—*
Garsky, Victor M.; and McGregor, William H., B 538,628, Cl. 260-112.50S.

American Optical Corporation: *See—*
Shoemaker, Arthur H., B 607,842, Cl. 350-87.000.

American Safety Equipment Corporation: *See—*
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Ziv, Avraham, B 791,477, Cl. 242-107.000.

American Seating Company: *See—*
Barecki, Chester J., B 774,528, Cl. 280-179.00R.

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Ames Rubber Corporation: *See—*
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AMI Industries, Inc.: *See—*
Reida, William D., B 818,805, Cl. 297-433.000.

Amin, Sanjay I.: *See—*
Modell, Michael; Reid, Robert C.; and Amin, Sanjay I., B 742,712, Cl. 48-202.000.

AMP Incorporated: *See—*
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Andena, Paolo: *See—*
Lecce, Giovanni; and Andena, Paolo, 4,112,530, Cl. 7-146.000.

Anderberg, Nils-Eric, to Fabriksmontering i Trelleborg AB. Canopy device. 4,112,958, Cl. 135-5.00A.

Anders, Dietmar, to Hermann Berstorff Maschinenbau GmbH. Apparatus for producing tubes by helically winding sheets. B 786,859, Cl. 156-431.000.

Andersen, John N.: *See—*
Bell, Norman; Andersen, John N.; and Lam, Hung-Kei H., B 855,506, Cl. 423-119.000.

Anderson, Leroy E.; Charlson, David V.; and Vierkant, Mark A., to Manufacturers Systems, Inc. Light gauge sheet metal forming machine. 4,112,731, Cl. 72-320.000.

Anderson, Lloyd R., to C-Line Products, Inc. Adjustable book holding device. B 819,332, Cl. 211-43.000.

Anderson, Lowell M.; and Simmons, William D. Soil compaction system. 4,112,692, Cl. 405-271.000.

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Aquila, Werner; Hoffmann, Werner; Himmele, Walter; and Siegel, Hardo, to BASF Aktiengesellschaft. Phenylpropanals. B 494,457, Cl. 260-599.000.

Arai, Atsuaki: *See—*
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Arai, Hiroshi; and Mori, Mamoru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seat belt device for use in vehicle. B 765,392, Cl. 280-747.000.

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Argus Chemical Corporation: *See—*
Minagawa, Motonobu; Ohzeki, Toshio; and Sekiguchi, Tetsuo, B 806,521, Cl. 260-23.70M.

Arizona Chemical Company: *See—*
Ruckel, Erwin Richard; and Wang, Long Shyong, B 814,527, Cl. 252-429.00B.

Armstrong Cork Company: *See—*
Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., B 878,679, Cl. 521-95.000.
Kauffman, William J., B 812,342, Cl. 544-67.000.

Armstrong, Donald D.: *See—*
Maier, Alfred E.; Armstrong, Donald D.; and Farley, James R., B 829,702, Cl. 200-153.00G.

Armstrong, Donald E.; Shaffer, John W.; Marecek, Paul M.; and Audesse, Emery G., to GTE Sylvania Incorporated. Multilamp photoflash unit with static grounding system. B 724,792, Cl. 431-95.00A.

Arnold, Hanfried, to Schering Aktiengesellschaft. Stabilizer for estrogens. B 751,676, Cl. 260-397.400.

Arpino, Roberto. Vehicle fuel economy indicator. B 808,024, Cl. 180-105.00E.

Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, to Snam Progetti, S.p.A. Process for producing stabilized olefin terpolymers and stabilized olefin terpolymers produced according to said process. B 775,776, Cl. 260-875.000.

Arrington Co., Inc.: *See—*
Arrington, James R., B 343,733, Cl. 210-96.00R.

Arrington, James R., to Arrington Co., Inc. Waste fluid treatment system. B 343,733, Cl. 210-96.00R.

Arthur, Hugh MacDonald: *See—*
Harrington, Timothy Cardell; and Arthur, Hugh MacDonald, B 744,880, Cl. 242-58.100.

Asahi-Dow Limited: *See—*
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, B 812,737, Cl. 260-874.000.

Asahi Glass Company, Ltd.: *See—*
Nomaki, Koji; and Saoyama, Yoshihito, 4,112,868, Cl. 118-429.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Shiga, Tetsuo; Ozaki, Masaru; Arakawa, Tatsumi; and Kobayashi, Hidehiko, B 751,778, Cl. 96-114.100.
Tanabe, Masanori; Ikeda, Masanori; and Tamura, Nobuhiro, B 786,325, Cl. 560-244.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Ebihara, Masatomi; Inoue, Masahide; and Hidaka, Tsuneo, B 802,856, Cl. 106-39.500.
Kawasaki, Masahiro, B 828,689, Cl. 354-289.000.
Yamamori, Eiji, B 718,414, Cl. 354-106.000.

Asakawa, Takeki: *See—*
Koike, Hiroshi; Suzuki, Shoji; and Asakawa, Takeki, B 778,240, Cl. 350-269.000.

Asano, Masaharu; and Kadowaki, Shunichi, to Nissan Motor Company, Limited. Method of and mixture control system for varying the mixture control point relative to a fixed reference. 4,112,880, Cl. 123-32.0EE.

Asari, Akira; and Tsuzuki, Hidehiro, to Kobe Steel, Ltd. Hydrostatic extrusion apparatus. 4,112,723, Cl. 72-60.000.

Asars, Juris A., to Westinghouse Electric Corp. Display panel with simplified thin film interconnect system. B 780,138, Cl. 315-169.0TV.

Ascani, Leonard A.: *See—*
Hamilton, C. Howard; and Ascani, Leonard A., B 736,671, Cl. 148-11.50R.

ASEA Aktiebolag: *See—*
Claesson, Harry; and Hellgren, Keijo, 4,112,724, Cl. 72-63.000.

Ashcraft, William R. Protected glassy phosphate detergent additive. B 631,026, Cl. 252-91.000.

Ashdown, Glynn R.; McCartney, Thomas; and Holmes, Bruce, to Teradyne, Inc. Testing electrically conductive lines to determine electrical characteristics thereof. B 622,054, Cl. 179-175.30R.

Ashida, Akira: *See—*
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, B 736,223, Cl. 352-194.000.

Aso, Toshio: *See—*
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.

Aspen Laboratories: *See—*
Pike, Harold L., 4,112,950, Cl. 128-303.140.

Assenheimer, Jurgen; Bianchi, Valerio; Brettschneider, Johannes; Latsch, Reinhard; and Scherenberg, Dieter, to Robert Bosch GmbH. Process for the regulation of the optimum operational behavior of an internal combustion engine. 4,112,879, Cl. 123-32.0EA.

Astolfi, Edmund G.: *See—*
Watt, William R.; Astolfi, Edmund G.; and Laufer, Jay K., B 743,133, Cl. 427-44.000.

Ateliers Reunis Societe Anonyme: *See—*
Joseph, Raymond, B 815,366, Cl. 220-19.000.

Atlantic Richfield Company: *See—*
Taylor, Robert Coleman, B 711,761, Cl. 252-61.000.

Atlas Copco Aktiebolag: *See—*
Goransson, Lars Roland; van Oorschot, Gosewinus Franciscus; and Pittoors, Jan Gustaaf, B 750,835, Cl. 55-97.000.
Lindblad, Lars Alfred, B 830,213, Cl. 173-1.000.

Atomic Energy Board: *See—*
Haarhoff, Pierre Cloete; and Schumann, Werner Adolf, B 819,016, Cl. 55-17.000.

Atwood, Gilbert Richard, to Union Carbide Corporation. Recovering sulfur from gas streams containing hydrogen sulfide. B 781,206, Cl. 423-574.00R.

Audesse, Emery G.: *See—*
Armstrong, Donald E.; Shaffer, John W.; Marecek, Paul M.; and Audesse, Emery G., B 724,792, Cl. 431-95.00A.

Auel, Theodor: *See—*
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; Auel, Theodor; and Kloss, Werner, B 815,160, Cl. 423-265.000.

August Lepper, Maschinen- und Apparatebau GmbH: *See—*
Muller, Franz, 4,112,590, Cl. 34-75.000.

August Stemmann OHG: *See—*
Stemmann, Karl; and Holtmeier, Gerhard, B 688,269, Cl. 191-67.000.

Aurora Equipment Company: *See—*
Mittag, Douglas C., B 782,185, Cl. 211-191.000.

Aurora Products Corporation: *See—*
Sims, Anson; and Jones, Lawrence T., B 723,815, Cl. 273-249.000.

aus der Funten, Helmut; and Vogt, Wilhelm, to Dynamit Nobel Aktiengesellschaft. Method of preparing phthalide. B 783,576, Cl. 260-343.30R.

Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for producing large-size substrate-based semiconductor material utilizing vapor-phase deposition and subsequent resolidification. B 737,249, Cl. 148-174.000.

Automobiles M. Berliet: *See—*
Nikly, Jean, 4,112,907, Cl. 123-193.0CH.

Automotive Products Limited: *See—*
Maycock, Ian Commander, B 797,768, Cl. 192-107.00C.

Autotronic Controls, Corp.: *See—*
Chapin, Leonard Lee; and Merrick, James Walter, 4,112,901, Cl. 123-139.00E.

Avco Corporation: *See—*
Kasmarik, Joseph R., 4,112,677, Cl. 60-226.00R.

Aya, Masayoshi; and Hiya, Kohji, to Matsushita Electric Industrial Co., Ltd. Convergence apparatus with variably magnetized magnets. B 808,567, Cl. 335-212.000.

Ayers, Robert Lee; and Hamaker, Raymond Weaver, to International Business Machines Corporation. Technique for preventing forward biased epi-isolation degradation. B 736,646, Cl. 148-1.500.

AZO-Maschinenfabrik Adolf Zimmermann: *See—*
Zimmermann, Adolf, 4,112,639, Cl. 52-174.000.

B. F. Goodrich Company, The: *See—*
Tucker, Harold A., B 724,945, Cl. 560-32.000.

Baccei, Louis J.: *See—*
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., B 706,087, Cl. 526-258.000.

Bachl, Robert: *See—*
Schweier, Gunther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, B 762,858, Cl. 526-124.000.

Bader, Hartmann, to Sulzer Brothers Limited. Loom harness. 4,112,980, Cl. 139-92.000.

Badran, Nasri W., to Badran, Nasri W. Microcrystalline 3-(alpha-acetonylbenzyl)-4-hydroxycoumarin (warfarin) and methods of making. B 496,932, Cl. 260-343.440.

Baggaley, Keith Howard, to Beecham Group Limited. 2-Substituted benzisothiazolones. B 738,000, Cl. 260-283.00S.

Bagnall, Robert David, to Imperial Chemical Industries Limited. Anaesthetic compositions. B 677,855, Cl. 424-342.000.

Baio, Alfred R.; and Genovese, David L., to Sealectro Corporation. Optical punched card reader. B 800,732, Cl. 235-458.000.

Baker Aktiengesellshaft: *See—*
Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, B 766,235, Cl. 424-273.00P.

Baker, Robert: *See—*
Grenfell, Hugh W.; Bowen, David J.; and Baker, Robert, B 792,602, Cl. 75-60.000.

Balco, Inc.: *See—*
Balzer, Claude P., 4,112,641, Cl. 52-179.000.

Balinte, Joe; and Verhaeghe, Michael. Plant puller. B 734,091, Cl. 171-61.000.

Ball, Kenneth, to Vickers-Intertek Limited. Sealing arrangements for use under water. B 771,356, Cl. 277-9.000.

Ballas, George C.; and Mitchell, Albert W., to Weed Eater, Inc. Lawn mower and method. 4,112,653, Cl. 56-12.700.

Ballentine, Earle W. Gas broiler. 4,112,912, Cl. 126-41.00R.

Balme, Maurice; and Gruffaz. Max, to Rhone-Poulenc S.A. Polyamines with imide groups. B 297,738, Cl. 260-326.260.

Balukin, Richard F., to Westinghouse Air Brake Company. Brake valve device. B 835,123, Cl. 303-54.000.

Balzer, Claude P., to Balco, Inc. Stair nosing structure. 4,112,641, Cl. 52-179.000.

Banks, Benjamin W. Liquid proportioner for pressure feed line. 4,112,964, Cl. 137-205.500.

Banyaszati Kutato Intezet: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.

Barbaresi, Charlotte, to Acricite Company, Inc. Convertible handbag. 4,112,991, Cl. 150-28.00A.

Bardenhagen, Dietrich; and Schubert, Bernhard, to Hauni-Werke Korber & Co. KG. Method and machine for the production of hinged-lid packs for groups of cigarettes or the like. 4,112,651, Cl. 53-449.000.

Barecki, Chester J., to American Seating Company. Wheelchair retainer mechanism. B 774,528, Cl. 280-179.00R.

Barlow, Harold Everard Monteagle, to National Research Development Corporation. Apparatus and methods for launching and screening electromagnetic waves in the dipole mode. B 755,844, Cl. 333-95.00R.

Barmag Barmer Maschinenfabrik AG: *See—*
Schippers, Heinz; Hensen, Friedhelm; Koslowski, Gerhard; and Czerwon, Dieter, B 722,558, Cl. 526-351.000.

Barnes, Richard D.: *See—*
Donnelli, Joseph W.; and Barnes, Richard D., B 821,809, Cl. 211-49.00R.

Barrington, Burchus Q.; and Williamson, Jim R., to Halliburton Company. Oil well testing safety valve. B 811,506, Cl. 166-334.000.

Barth, Wayne E., to Pfizer Inc. 4-(Tetrazol-5-yl)-Δ^3-cephem compounds. B 791,537, Cl. 544-23.000.

Barthell, Eduard: *See—*
Hubner, Wolfgang; Barthell, Eduard; and Dahmen, Kurt, B 682,543, Cl. 260-29.4UA.

Barzynski, Helmut; and Heil, Guenter, to BASF Aktiengesellschaft. Benzophenone-containing photopolymerizable binders for printing inks and coating compositions. B 834,796, Cl. 204-159.150.

BASF Aktiengesellschaft: *See*—
Aquila, Werner; Hoffmann, Werner; Himmele, Walter; and Siegel, Hardo, B 494,457, Cl. 260-599.000.
Barzynski, Helmut; and Heil, Guenter, B 834,796, Cl. 204-159.150.
Dehnert, Johannes; and Dunkelmann, Guenter, B 660,985, Cl. 260-154.000.
Distler, Harry; Schlecht, Helmut; and Hartert, Erwin, B 743,517, Cl. 260-465.50A.
Fischer, Adolf, deceased; and Hamprecht, Gerhard, B 636,162, Cl. 544-11.000.
Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, B 780,297, Cl. 260-429.00R.
Opgenorth, Hans-Joachim; and Scheuermann, Horst, B 810,950, Cl. 260-305.000.
Schweier, Gunther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, B 762,858, Cl. 526-124.000.

BASF Wyandotte Corporation: *See*—
Helfert, Herbert; Davis, Pauls; and Langdon, William Keith, B 736,959, Cl. 260-615.00B.

Baskett, Theodore N. Multiple shaft, ground-raking attachment for bucket-equipped tractors. B 747,966, Cl. 171-63.000.

Baso, Jozsef: *See*—
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.

Basoms, John A.: *See*—
Rabi, Rafat T.; Murphy, Edward J.; and Basoms, John A., B 745,240, Cl. 204-181.00C.

Bassous, Ernest; and Liu, Cheng-Yih, to International Business Machines Corporation. Polycrystalline silicon etching with tetramethylammonium hydroxide. B 861,373, Cl. 156-662.000.

Bates, Jack A. Carpet cleaning machine. 4,112,538, Cl. 15-321.000.

Battigelli, Jean A.: *See*—
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, B 829,515, Cl. 65-5.000.

Battiston, Giancarlo: *See*—
Padovan, Mario; De Alberti, Giordano; Battiston, Giancarlo; and Covini, Romano, B 734,248, Cl. 562-534.000.

Bauch, Helmut; Mohrmann, Karl Heinz; and Koppehele, Frithjof, to Siemens Aktiengesellschaft. Remotely fed intermediate amplifier for communication lines. B 795,706, Cl. 330-56.000.

Bauer, William V., to Lummus Company, The. Two-stage hydrotreating of pyrolysis gasoline to remove mercaptan sulfur and dienes. B 843,413, Cl. 208-89.000.

Baugh, Benton F. Rotational speed reduction and reversing mechanisms. 4,112,781, Cl. 74-198.000.

Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, to Merck Patent Gesellschaft mit beschrankter Haftung. Prostenoic acid derivatives. B 739,142, Cl. 424-205.000.

Baur, Guenter; and Greubel, Waldemar, to Siemens Aktiengesellschaft. Indicating device for illustrating symbols of all kinds. B 782,186, Cl. 350-285.000.

Bausch & Lomb Incorporated: *See*—
Clark, James A.; Livesey, Donald V.; and Wrue, Richard J., B 762,221, Cl. 249-105.000.

Baxley, James Russell, to Peanut Research & Testing Laboratories, Inc. Process for making hydrated peanut products and products made thereby. B 779,030, Cl. 426-509.000.

Baxter Travenol Laboratories, Inc.: *See*—
Grode, Gerald Arthur; Boggs, Daniel Roy; and Wright, James Irvin, 4,112,989, Cl. 150-1.000.
Lolachi, Houshang, B 657,187, Cl. 233-25.000.

Bayer Aktiengesellschaft: *See*—
Bischoff, Jurgen; Kowitz, Friedrich; Ott, Karl-Heinz; Schuster, Herbert; Rohr, Harry; and Weitzel, Hans, B 400,980, Cl. 260-876.00R.
Bock, Manfred; Pedain, Josef; and Uerdingen, Walter, B 778,631, Cl. 260-859.00R.
Fiege, Helmut; Haydn, Josef; Renner, Johann; and Wedemeyer, Karlfried, B 757,422, Cl. 568-756.000.
Hugl, Herbert; Schundehutte, Karl Heinz; Trautner, Kersten; and Wolfrum, Gerhard, B 813,311, Cl. 8-41.00R.
Huper, Fritz; and Oberheiden, Helmut, B 692,876, Cl. 544-20.000.
Kubens, Rolf; and Gebauer, Herbert, B 796,935, Cl. 166-295.000.
Lantzsch, Reinhard, B 795,588, Cl. 560-124.000.
Maurer, Fritz; Riebel, Hans-Jochem; Homeyer, Bernhard; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, B 645,128, Cl. 424-200.000.
Merz, Walter, B 640,830, Cl. 562-577.000.
Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, B 693,971, Cl. 548-377.000.
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, B 678,822, Cl. 260-348.250.
Sackmann, Gunter; Hendricks, Udo-Winfried; Honig, Hans-Ludwig; Kolb, Gunter; and Muller, Friedhelm, B 749,455, Cl. 106-238.000.
Siegle, Peter; Kuhle, Engelbert; Hammann, Ingeborg; Homeyer, Bernhard; and Behrenz, Wolfgang, B 592,860, Cl. 424-278.000.

Bayer Italia Societa per Azioni: *See*—
Dondi, Gilberto; and Zanotti, Arnaldo, B 743,853, Cl. 424-230.000.

BBC Brown Boveri & Company Limited: *See*—
Beckershoff, Wolfgang, 4,112,582, Cl. 33-181.00R.

Beamer/Wilkinson & Associates: *See*—
Hanway, John E., Jr.; and Mumford, Richard G., B 507,290, Cl. 423-242.000.

Beasley, Donald R., to Norfield Corporation. Method for forming expanded panels from thermoformable material and the resultant product. B 763,097, Cl. 428-116.000.

Beatenbough, Paul K.: *See*—
Flower, Robert J.; Snedeker, Clarke R.; and Beatenbough, Paul K., B 789,066, Cl. 165-81.000.

Beauchamp, Miles Albert: *See*—
Torr, Ralph Percival; and Beauchamp, Miles Albert, B 765,274, Cl. 174-42.000.

Bebie, Paul: *See*—
Oderbolz, Fredy; and Bebie, Paul, 4,112,983, Cl. 139-446.000.

Bechtel, Charles H.: *See*—
McHenry, Donald L.; and Bechtel, Charles H., B 746,270, Cl. 106-287.180.

Beck, Gerhard: *See*—
Linkies, Adolf; Reuschling, Dieter-Bernd; Kuhlein, Klaus; Beck, Gerhard; and Musil, Josef, B 751,173, Cl. 424-274.000.

Beck, Johann: *See*—
Eppe, Rudolf; Schnall, Gunther; Mullritter, Ludwig; Beck, Johann; and Hartwig, Karl, B 699,341, Cl. 355-8.000.

Beckerman, Arthur. Wood carving kit. B 838,533, Cl. 206-575.000.

Beckershoff, Wolfgang, to BBC Brown Boveri & Company Limited. Apparatus for positioning coaxial arranged machine parts. 4,112,582, Cl. 33-181.00R.

Becton, Dickinson and Company: *See*—
Carstens, Dennis L., B 824,412, Cl. 206-365.000.

Beecham Group Limited: *See*—
Baggaley, Keith Howard, B 738,000, Cl. 260-283.00S.
Clark, Judith Ann, B 698,091, Cl. 560-250.000.
Cole, Martin; Hood, John Dick; and Butterworth, Dennis, B 717,334, Cl. 424-117.000.
Gardner, Derek Victor, B 710,446, Cl. 424-258.000.

Beery, Peter W., to Golf Resources, Ltd. Golf club and manufacture thereof. B 803,976, Cl. 273-78.000.

Behrenz, Wolfgang: *See*—
Maurer, Fritz; Riebel, Hans-Jochem; Homeyer, Bernhard; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, B 645,128, Cl. 424-200.000.
Siegle, Peter; Kuhle, Engelbert; Hammann, Ingeborg; Homeyer, Bernhard; and Behrenz, Wolfgang, B 592,860, Cl. 424-278.000.

Beier, Alfred, to Volkswagenwerk Aktiengesellschaft. Exhaust gas return valve actuating rod. 4,112,783, Cl. 74-470.000.

Beile, Richard W.: *See*—
Soja, Lawrence M.; Stokes, Daniel F.; and Beile, Richard W., B 762,874, Cl. 206-602.000.

Beland, Stig Gosta Bele, to Granges Essem Aktiebolag. Device for changing the force acting on a reversibly rotatable shaft. B 765,282, Cl. 185-10.000.

Belgium Tool & Die Co.: *See*—
Cvacho, Daniel S., B 727,447, Cl. 55-319.000.

Belinkoff, Irving R., to Kidde Consumer Durables Corp. Food processor. B 790,509, Cl. 241-37.500.

Bell, Mace, to United Technologies Corporation. Vehicle diagnostic hand control. B 819,744, Cl. 174-52.00R.

Bell, Norman; Andersen, John N.; and Lam, Hung-Kei H., to Kaiser Aluminum & Chemical Corporation. Process for the utilization of waste materials from electrolytic aluminum reduction systems. B 855,506, Cl. 423-119.000.

Bell, Robert Martin Alistair: *See*—
Aldridge, Trevor John; Lock, Alan Howard; and Bell, Robert Martin Alistair, 4,112,747, Cl. 73-116.000.

Bell Telephone Laboratories, Incorporated: *See*—
Clement, George Frederick; and Sniegowski, Bruno Raymond, B 844,377, Cl. 179-2.00A.
Demers, Robert Augustus, B 716,581, Cl. 340-147.00R.
Katz, Lewis Emanuel; and Paulnack, Carl Lewis, B 853,126, Cl. 156-612.000.
King, William Clifton, B 573,401, Cl. 357-19.000.
Sanderson, Richard Barton, B 798,787, Cl. 179-170.0NC.

Bella, Frank, Jr.; and Bennett, Richard C., to Whiting Corporation. Elutriation leg and method. B 712,033, Cl. 159-27.00A.

Bellanca, Nicolo; and Furia, Thomas Edward, to Dynapol. Zoned coloration. B 799,795, Cl. 106-137.000.

Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., to Bristol-Myers Company. $\Delta^{2,3}$-1,4-Morpholine-2-carboxylic acid derivatives as antibacterial agents. B 760,620, Cl. 544-105.000.

Beloit Corporation: *See*—
Min, Tony C.; and Hergert, Richard E., 4,112,549, Cl. 19-304.000.

Belsick, James C.: *See*—
Garin, John; and Belsick, James C., B 714,220, Cl. 176-87.000.

Benac, Bernard Henri Jean; Benac, Jacques Marie Lucien; and Benac, Henri. Beater for a grape harvesting machine, as well as grape harvesting machines provided with such a beater. 4,112,657, Cl. 56-330.000.

Benac, Henri: *See*—
Benac, Bernard Henri Jean; Benac, Jacques Marie Lucien; and Benac, Henri, 4,112,657, Cl. 56-330.000.

Benac, Jacques Marie Lucien: *See—*
Benac, Bernard Henri Jean; Benac, Jacques Marie Lucien; and Benac, Henri, 4,112,657, Cl. 56-330.000.
Benes, Ivan, to Solco Basel AG. Composition for the diagnostic visualization of neoplastic tissues. B 572,701, Cl. 424-1.000.
Benham, Harold L.; Clark, Steven D.; Huffman, Hubert L.; and Stovall, Ronald J., to United States of America, Navy. Battery thermal runaway monitor. B 806,799, Cl. 320-39.000.
Benkoe, Erwin: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; and Robinson, Don, B 770,186, Cl. 273-108.000.
Bennett, Richard C.: *See—*
Bella, Frank, Jr.; and Bennett, Richard C., B 712,033, Cl. 159-27.00A.
Bennett, Robert P.; and Kober, Alfred E., to Appollo Chemical Corporation. Method of conditioning flue gas. B 792,939, Cl. 55-5.000.
Bereskin, Fred Phillip; and Borowczyk, Joseph Jerome. Grease separator. B 789,426, Cl. 210-72.000.
Bergman, Gunnar B., to Seatek Corporation. Heave stabilization of semi-submersible platforms. 4,112,864, Cl. 114-265.000.
Bergwerksverband GmbH: *See—*
Kroger, Carl; Romey, Ingo; and Kolling, Georg, B 649,920, Cl. 264-120.000.
Berkmont Industries: *See—*
McElroy, John O., Jr., B 750,330, Cl. 181-230.000.
Bernard, George G.; and Holm, LeRoy W., to Union Oil Company of California. Enhanced oil recovery process. B 774,920, Cl. 166-273.000.
Bernard, Walter J.: *See—*
Randall, John J., Jr.; and Bernard, Walter J., B 791,656, Cl. 204-33.000.
Bernardi, Carl E.: *See—*
Ross, John P.; and Bernardi, Carl E., B 776,162, Cl. 204-15.000.
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. 5,6-Dihydropyrimidin-4(3H)one derivatives, and antiedema compositions and methods employing them. B 728,459, Cl. 424-251.000.
Bernheim, Willy: *See—*
Deiner, Hans; Mosch, Franz; and Bernheim, Willy, B 554,819, Cl. 544-196.000.
Berry, Lawrence James; and Hall, Stanley Darwin, to W. R. Grace & Co. Sealed taped bags and sealed tape bag dispenser. B 796,279, Cl. 221-1.000.
Berthet, Andre, to Cebal. Rolled edge in cans. B 757,135, Cl. 220-74.000.
Berzinya, Irma Arnoldovna: *See—*
Aren, Avgust Karlovich; Berzinya, Irma Arnoldovna; and Lentsbergs, Ivars Petrovich, B 679,869, Cl. 544-152.000.
Bess, Leon. Controlled pulse turbine engine. 4,112,683, Cl. 60-595.000.
Bessinger, Max E. Portable support. B 780,606, Cl. 182-187.000.
Bethlehem Steel Corporation: *See—*
Kreiger, John W., B 734,771, Cl. 75-256.000.
Better Agricultural Goals Corporation: *See—*
Williamson, Robert R., B 460,053, Cl. 222-105.000.
Bianchetta, Donald Louis, to Caterpillar Tractor Co. Fluid control system for multiple circuited work elements. 4,112,821, Cl. 91-6.000.
Bianchi, Valerio: *See—*
Assenheimer, Jurgen; Bianchi, Valerio; Brettschneider, Johannes; Latsch, Reinhard; and Scherenberg, Dieter, 4,112,879, Cl. 123-32.0EA.
Bidwell, Robert E.: *See—*
Kurtz, Leonard D.; and Bidwell, Robert E., 4,112,948, Cl. 128-276.000.
Biehler, Jean-Marie J.: *See—*
Lecolier, Serge L.; and Biehler, Jean-Marie J., B 838,460, Cl. 521-108.000.
Bierman, Francis Andrew. Anti-theft clip. B 806,374, Cl. 292-346.000.
Bigot, Lucien: *See—*
Kemper, Yves Jean; and Bigot, Lucien, 4,112,779, Cl. 74-191.000.
Kemper, Yves Jean; and Bigot, Lucien, 4,112,780, Cl. 74-191.000.
Billings, William G., to Phillips Petroleum Company. Conversion of organic sulfides to corresponding sulfoxides. B 811,426, Cl. 260-607.0AR.
Bindicator Company: *See—*
Levine, Walter E., B 777,433, Cl. 356-201.000.
Bindra, Jasjit S.: *See—*
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., B 854,392, Cl. 260-347.300.
Bini, Franco, to Macchine Tessili Circolari Matec S.p.A. Rocking jack safety device. 4,112,712, Cl. 66-157.000.
Binkhorst, Richard D. Sterile package. B 803,959, Cl. 206-210.000.
Biricz, Stefan, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Starter bar head arrangement. B 749,119, Cl. 164-446.000.
Birkeholm, Mogens. Method and tractor for towing aircraft. B 786,565, Cl. 180-14.00C.
Bischoff, Dieter: *See—*
Schafer, Werner; Buchwald, Holger; and Bischoff, Dieter, B 637,488, Cl. 428-220.000.
Bischoff, Jurgen; Kowitz, Friedrich; Ott, Karl-Heinz; Schuster, Herbert; Rohr, Harry; and Weitzel, Hans, to Bayer Aktiengesellschaft. Process for working up dispersions of elastic-thermoplastic or thermoplastic plastics. B 400,980, Cl. 260-876.00R.
Bissinger, Wilma. Storage bin. 4,112,634, Cl. 52-67.000.
Biven, Earl U. Sun-shield for backpackers. 4,112,957, Cl. 135-5.00C.
Blachly, Paul H. Bite block assembly adapted for adjustable mounting and holding of oral airways and method of using same. 4,112,936, Cl. 128-136.000.
Black Clawson Company, The: *See—*
Detcher, Theodore E., B 799,555, Cl. 210-409.000.
Black Clawson Fibreclaim, Inc.: *See—*
Marsh, Paul G.; and Kohlhepp, Dean H., B 804,786, Cl. 241-21.000.
Blankumsee, Howard: *See—*
Collins, Walter; and Blankumsee, Howard, B 785,834, Cl. 238-72.000.
Blasko, Jan: *See—*
Chrtek, Milan; Gabler, Josef; Tuma, Frantisek; Kasparek, Karel; and Blasko, Jan, 4,112,663, Cl. 57-58.890.
Bleckmann, Hans W., to ITT Industries, Inc. Anti-skid electronic control system having an error detecting circuit. B 772,798, Cl. 303-92.000.
Bliss & Laughlin Industries Incorporated: *See—*
Godwin, Robert H.; and Collignon, Herbert E., B 764,371, Cl. 248-400.000.
Bliudnikas, Kestutis E., to Alden Research Foundation. Precision track for moving facsimile recording blade. B 754,904, Cl. 346-139.00C.
Blocker, William C. Connection fitting. B 783,054, Cl. 285-14.000.
Blount, David H. Process for the production of acrylic compounds and resinous products. B 804,897, Cl. 528-271.000.
Blumenfeld, Georg; and Vollkommer, Norbert, to Dynamit Nobel Aktiengesellschaft. Unsaturated polyesters derived from chloroxylylene diols. B 640,312, Cl. 528-299.000.
Bobkov, Lev Nikolaevich: *See—*
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, B 702,208, Cl. 423-131.000.
Bochan, John, to General Electric Company. Clothes dryer variable speed drive system. 4,112,767, Cl. 74-217.00R.
Bock, Manfred; Pedain, Josef; and Uerdingen, Walter, to Bayer Aktiengesellschaft. Triisocyanates useful for the production of polyurethane resins. B 778,631, Cl. 260-859.00R.
Bodolay, William A. Hot wire packaging machine. 4,112,652, Cl. 53-211.000.
Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., to Libbey-Owens-Ford Company. Method of and apparatus for thermally severing glass. B 767,051, Cl. 225-2.000.
Boehringer Ingelheim GmbH: *See—*
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, B 812,325, Cl. 260-570.900.
Boehringer Mannheim GmbH: *See—*
Stach, Kurt, deceased; Bosies, Elmar; Heerdt, Ruth; Kuhnle, Hans-Frieder; and Schmidt, Felix Helmut, B 674,993, Cl. 424-272.000.
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, to Banyaszati Kutato Intezet; Skotchinksy Institut Gornogo Dela; and Taurus Gumiipari Vallalat. End fitting for multichannel hose. B 787,511, Cl. 285-137.00R.
Boggs, Daniel Roy: *See—*
Grode, Gerald Arthur; Boggs, Daniel Roy; and Wright, James Irvin, 4,112,989, Cl. 150-1.000.
Bolick, Fred C., Jr.; and Titus IV, Theodore, to Lanier Business Products, Inc. Dictation recording and transcribing system utilizing selectable dual message record-playback apparatus. B 719,423, Cl. 179-100.1DR.
Bolkow Gesellschaft mit beschrankter Haftung: *See—*
Kocher, Heinz; Kitzig, Werner; and Witteveen, Piet Jozef, B 566,178, Cl. 244-3.110.
Bom, Cornelis Johannes Gerardus: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, B 686,327, Cl. 172-59.000.
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, B 772,858, Cl. 172-59.000.
Bonazoli, Robert P.; and Morgan, William H., Jr., to GTE Sylvania Incorporated. Flashlamp assembly with tapered housing. B 812,916, Cl. 431-93.000.
Bond, John A., to ACF Industries, Incorporated. Seat structure for gate valves. B 841,225, Cl. 251-328.000.
Bonnemay, Maurice Gabriel Ernst: *See—*
Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, B 605,926, Cl. 204-180.00R.
Booty, Donald J., to Feldmar Products, Inc. Mechanical channel selector device. B 726,479, Cl. 325-390.000.
Borchert, Werner: *See—*
Treplin, Friedrich-Wilhelm; and Borchert, Werner, B 781,489, Cl. 165-95.000.
Boretos, John W.: *See—*
Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., 4,112,952, Cl. 128-418.000.

Borg-Warner Corporation: *See—*
Hechenbleikner, Ingenuin; and Enlow, William Palmer, B 795,461, Cl. 260-969.000.
Kountz, Kenneth John, 4,112,703, Cl. 62-211.000.

Borowczyk, Joseph Jerome: *See—*
Bereskin, Fred Phillip; and Borowczyk, Joseph Jerome, B 789,426, Cl. 210-72.000.

Borowick, John Joseph, to United States of America, Army. L-Band radar antenna array. B 747,765, Cl. 343-815.000.

Bos, Frans, to Saab-Scania AB. Winddeflector. B 760,746, Cl. 296-137.00J.

Bosies, Elmar: *See—*
Stach, Kurt, deceased; Bosies, Elmar; Heerdt, Ruth; Kuhnle, Hans-Frieder; and Schmidt, Felix Helmut, B 674,993, Cl. 424-272.000.

Bost, Pierre-Etienne; and Lartigau, Guy, to Rhone-Poulenc S.A. Preparation of ketones. B 473,267, Cl. 260-592.000.

Bottaccio, Giorgio: *See—*
Alneri, Enzo; Bottaccio, Giorgio; Campolmi, Stefano; and Cassar, Luigi, B 816,919, Cl. 568-716.000.

Boucard, Michel Jean, to Societe Industrielle et Financiere le Profil. Cold profiling machine. 4,112,722, Cl. 72-181.000.

Bouquet, Jean-Claude, to Societe d'Etudes de Machines Thermiques. Internal combustion engine fit-up device. 4,112,883, Cl. 123-52.00M.

Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., to Delalande S. A. Aminoalkoxybenzofurans. B 813,357, Cl. 544-360.000.

Bourlet, Maurice V., to Fabrique Nationale Herstal S.A. en abrege FN. Supply device for a portable firearm by means of cartridge belts or by means of rifle magazines using the same ammunition. 4,112,817, Cl. 89-33.00B.

Bourns, Inc.: *See—*
DeRouen, Joseph Rodolph; and Kucharski, Lawrence, Jr., B 800,600, Cl. 338-174.000.
Stephens, Donald Harrison, B 878,191, Cl. 338-174.000.

Bowen, David J.: *See—*
Grenfell, Hugh W.; Bowen, David J.; and Baker, Robert, B 792,602, Cl. 75-60.000.

Bower, Barton Keeley, to Hercules Incorporated. Tetra (bicycloheptyl) transition metal compounds. B 782,265, Cl. 260-429.500.

Bowker, Donald R.; Klein, Donald J.; and Rados, Stephen E., to Philips Industries Inc. Method of forming a bell end on thermoplastic pipe. B 656,538, Cl. 264-295.000.

Bowman, Frank L.: *See—*
Driscoll, Michael J.; and Bowman, Frank L., B 723,403, Cl. 176-38.000.

Boyd, William Weller; Grafe, Robert Joseph; and Pingry, Carl Oscar, III, to International Business Machines Corporation. Security controlled information exchange system. B 762,376, Cl. 340-147.00R.

Bradley, Edmund G., to Marden Manufacturing Company, Inc. Spot planter. 4,112,857, Cl. 111-3.000.

Bradley, Terrag W., to Supra Products, Inc. Key box. 4,112,717, Cl. 70-63.000.

Brager, Douglas R. Interior-exterior truck body wash. 4,112,533, Cl. 15-53.00A.

Brago, Reacelyn A. Multi-fluid wash system. B 779,151, Cl. 239-304.000.

Brainard, Edward C., II: *See—*
Kerfoot, William B.; and Brainard, Edward C., II, 4,112,741, Cl. 73-53.000.

Brana, George; and Russell, John J., to Pitney-Bowes, Inc. Carrier particles having the surface thereof treated with perfluoro sulfonic acid and method of making the same. B 840,305, Cl. 252-62.10P.

Brandestini, Marco, to Contraves AG. Method and apparatus for determining a change of the flow state of flowable substances from its static state to its flowing state or vice verse. 4,112,740, Cl. 73-53.000.

Brandt, David W.: *See—*
Brandt, Paul W., B 791,030, Cl. 214-1.0HA.

Brandt, Paul W., to Brandt, David W. Device for towing rolled bales of hay. B 791,030, Cl. 214-1.0HA.

Brandwein, Arthur. Tape splicing device and dispenser therefor. B 712,951, Cl. 428-42.000.

Braulke, Herbert A., III. Combined hot air and steam hair dryer. B 825,185, Cl. 219-362.000.

Brechbuhl, Heinz, to Maschinenfabrik Kern AG Konolfingen. Cutter apparatus for dividing a form band or the like into individual forms. 4,112,796, Cl. 83-141.000.

Breckenridge, George J.: *See—*
Kalnin, Ilmar L.; and Breckenridge, George J., B 759,927, Cl. 260-857.0TW.

Breedis, John F.: *See—*
Fister, Julius C., Jr.; Breedis, John F.; and Pryor, Michael J., B 784,155, Cl. 75-142.000.

Bregeon, Genevieve C.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., B 813,357, Cl. 544-360.000.

Breitzke, Willi: *See—*
Koch, Karlheinz; and Breitzke, Willi, B 741,160, Cl. 252-56.00S.

Brentford Electric Limited: *See—*
Fry, Michael George Joseph, B 733,476, Cl. 324-0.50E.

Bretone, John, Jr. Method of installing plumbing. 4,112,567, Cl. 29-157.00R.

Brettschneider, Johannes: *See—*
Assenheimer, Jurgen; Bianchi, Valerio; Brettschneider, Johannes; Latsch, Reinhard; and Scherenberg, Dieter, 4,112,879, Cl. 123-32.0EA.

Breuer, Hermann: *See—*
Treuner, Uwe D.; and Breuer, Hermann, B 776,400, Cl. 544-26.000.

Brewster, Franklin Crawford, to Motorola, Inc. Alternator bearing retainer plate. B 706,670, Cl. 308-26.000.

Bridgestone Tire Company Limited: *See—*
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; and Suzuki, Shosuke, B 730,115, Cl. 181-284.000.

Brimm, Daniel J., to Chem-tronics, Inc. Chemical milling process. B 785,168, Cl. 156-639.000.

Brister, Beryle D. Apparatus for freezing a slug of liquid in a section of a large diameter fluid transmission line. 4,112,706, Cl. 62-514.00R.

Bristol-Myers Company: *See—*
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., B 760,620, Cl. 544-105.000.

British Gas Corporation: *See—*
Smith, Trevor, B 714,984, Cl. 181-230.000.

British Petroleum Company Limited, The: *See—*
Webb, Michael Guthrie, 4,112,689, Cl. 405-63.000.

British Steel Corporation: *See—*
Grenfell, Hugh W.; Bowen, David J.; and Baker, Robert, B 792,602, Cl. 75-60.000.

Brito, Teodoro Guzman. Key ring holder. B 765,267, Cl. 224-5.00R.

Britool Limited: *See—*
Smyth, Norman Linfoot, 4,112,749, Cl. 73-139.000.

Brobeck, William M., to Electric Power Research Institute, Inc. Ring assembly for inertial energy storage rotor. 4,112,785, Cl. 74-572.000.

Brockway, Charles E., to Sybron Corporation. Headrest for dental chair. B 861,351, Cl. 297-408.000.

Brooks, Burton; and Brooks, Richard J., to Chemithon Corporation, The. Sulfonating apparatus. B 746,242, Cl. 422-193.000.

Brooks, Richard J.: *See—*
Brooks, Burton; and Brooks, Richard J., B 746,242, Cl. 422-193.000.

Brosow, Jorgen; and Furugard, Erik, to Dasy Inter S.A. Documents having fibers which are coated with a magnetic or magnetizable material embedded therein and an apparatus for checking the authenticity of the documents. B 647,935, Cl. 235-493.000.

Brouillette, Rudolph G.: *See—*
Huly, William; and Brouillette, Rudolph G., 4,112,862, Cl. 114-221.00R.

Brovedan, Antonio: *See—*
Ferrentino, Antonio; and Brovedan, Antonio, 4,112,660, Cl. 57-59.000.

Brown Boveri Corporation: *See—*
Hochstrasser, Otto; and Ruby, William S., B 826,189, Cl. 13-2.00R.

Brown, Francis Barton; and Erickson, John W., to Kobe, Inc. Gas/liquid separator. B 768,581, Cl. 55-203.000.

Brown, Jack E., Jr., to Goodyear Tire & Rubber Company, The. Reduction of lateral force variations of a tire effective in both forward and rearward senses of rotation. 4,112,630, Cl. 51-281.00R.

Brown, Marshall B. Method and apparatus for making pipe flanges. 4,112,727, Cl. 72-142.000.

Brown, Rex M. Combined fireplace hood and heating unit. 4,112,914, Cl. 126-121.000.

Brown, Robert M.; and Karliner, Rudolf R., to Valley Hydro-Luft, Inc. Dispensing gun. B 723,465, Cl. 222-324.000.

Brown & Root, Inc.: *See—*
Lammert, Wayne F.; Simpson, Dayton M.; and Desai, Ardeshir R., 4,112,698, Cl. 405-167.000.

Brown, William L.; and Reagan, Larry L., to SI Handling Systems, Inc. Apparatus for loading articles onto vertically spaced horizontally disposed shelves. B 767,267, Cl. 214-16.40A.

Brownawell, Darrell W.: *See—*
Lonstrup, Thorkild F.; Brownawell, Darrell W.; Goletz, Edward, Jr.; and Numair, Solomon J., B 741,032, Cl. 252-51.50A.

Brubaker, John M. Siphon tube starter. 4,112,963, Cl. 137-148.000.

Bruns, Klaus: *See—*
Conrad, Jens; and Bruns, Klaus, B 765,531, Cl. 252-522.000.

Bruton, James Isaac: *See—*
Russell, William Norman; Bruton, James Isaac; and Twilley, Ian Charles, B 829,764, Cl. 264-210.00F.

Buchwald, Holger: *See—*
Schafer, Werner; Buchwald, Holger; and Bischoff, Dieter, B 637,488, Cl. 428-220.000.

Buck, David Lyndon: *See—*
Mills, Anthony Mark; and Buck, David Lyndon, 4,112,994, Cl. 152-354.00R.

Buckeye Cellulose Corporation, The: *See—*
LaFitte, Larry L.; and Camden, James B., B 741,640, Cl. 428-284.000.

Bucksch, Gunter: *See—*
Spengler, Hans; Bucksch, Gunter; and Morgenstern, Manfred, B 704,600, Cl. 526-64.000.

Budzich, Tadeusz. Load responsive fluid control valves. 4,112,679, Cl. 60-445.000.

Bugge, Hans Jorgen; Strandly, Ingvald; and Swanberg, Carl Olof, to Nordiska Maskinfilt Aktiebolaget. Forming wire for use in papermaking, cellulose and similar machines. 4,112,982, Cl. 139-425.00A.

Buitelaar, Arnold A.: *See—*
Hoff, Siebe; Ockers, Gerhardus; Buitelaar, Arnold A.; and Van De Kraats, Eduard J., B 779,645, Cl. 44-66.000.

Buker, Donald O., to AMAX Inc. Vacuum smelting process for producing ferrotungsten. B 768,386, Cl. 75-211.000.

Bunce, Roger Abraham: *See—*
Duff, Ian David; Kennedy, John Hamilton; and Bunce, Roger Abraham, B 712,164, Cl. 422-63.000.

Bundy, Richard P., to Standard Havens, Inc. Baghouse cleaning method. B 827,942, Cl. 55-96.000.

Bunker Ramo Corporation: *See—*
Spaulding, Tedford Hollace, B 756,497, Cl. 339-97.00R.

Bunting, Pamela M.; and Deffner, John F., to Gulf Research & Development Co. Microbicide for use with hydrocarbon fuels. B 751,256, Cl. 44-72.000.

Burns, Donald Arthur; and Fontanilles, Henry, to Technicon Instruments Corporation. Method and apparatus for solute transfer. B 749,558, Cl. 356-36.000.

Burns, Henry L., to Cavitron Corporation. Tidal volume display. 4,112,931, Cl. 128-2.080.

Burr Oak Tool & Gauge Company: *See—*
Franks, Lawrence A.; Stroup, Steven L.; and Perry, James E., 4,112,794, Cl. 82-64.000.

Burroughs Corporation: *See—*
Maloney, Thomas C.; and Cola, Rudolph A., B 685,526, Cl. 340-343.000.

Burroughs, Joe D.: *See—*
Manda, John G.; Burroughs, Joe D.; and Cairns, Donald F., B 647,937, Cl. 202-227.000.

Burroughs Wellcome Co.: *See—*
Wood, Hamish Christopher Swan; and Paterson, Thomas, B 335,102, Cl. 424-180.000.

Burton, Parsons and Company, Inc.: *See—*
Holcombe, Frank O., Jr., B 805,146, Cl. 260-29.6TA.

Burtov, Oleg Antonovich: *See—*
Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich, 4,112,702, Cl. 62-123.000.

Bush, Austin R.; and Ferrarese, Frank L., to Worthington Pump, Inc. Support fixtures for preassembled unit or cartridge for multi-stage barrel type centrifugal pumps. B 773,778, Cl. 206-319.000.

Bush, Robert F.; and Mitchell, Joseph W., to International Business Machines Corporation. Process for producing magnetic particles by vacuum evaporation of iron with collection on a magnetized surface. B 799,034, Cl. 148-6.350.

Bushman, Willard T.; and Snyder, Robert C., to Documation Incorporated. Data card reader employing synchronization and resynchronization means. B 608,897, Cl. 235-474.000.

Butterworth, Dennis: *See—*
Cole, Martin; Hood, John Dick; and Butterworth, Dennis, B 717,334, Cl. 424-117.000.

Buttner, Hans Hugo. Apparatus for connecting the tying means ends on tying machines. 4,112,839, Cl. 100-33.0PB.

Butwell, Kenneth Francis: *See—*
Kendall, John Edward; and Butwell, Kenneth Francis, B 836,542, Cl. 423-226.000.

C. A. Weidmuller KG: *See—*
Wiener, Hans, 4,112,791, Cl. 81-9.50A.

C. H. Heist Corporation: *See—*
Wild, Robert W.; and Keeney, Joseph G., 4,112,535, Cl. 15-98.000.

C. L. Frost & Son, Inc.: *See—*
Vander Meulen, Douglas J., B 826,758, Cl. 308-187.100.

C-Line Products, Inc.: *See—*
Anderson, Lloyd R., B 819,332, Cl. 211-43.000.

C. van der Lely N.V.: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, B 686,327, Cl. 172-59.000.
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, B 772,858, Cl. 172-59.000.

Cabot Corporation: *See—*
Rivers, Ronald D., B 748,821, Cl. 75-214.000.

Cade, Phillip J., to Electronics Corporation of America. Burner control apparatus. B 675,778, Cl. 431-78.000.

Cairns, Donald F.: *See—*
Manda, John G.; Burroughs, Joe D.; and Cairns, Donald F., B 647,937, Cl. 202-227.000.

Caknis, Nicholas. Air-conditioning. B 678,742, Cl. 236-49.000.

Caldwell, Joseph M., to Jennings Compound Bow, Inc. Compound bow. 4,112,909, Cl. 124-23.00R.

California Institute Research Foundation: *See—*
Jones, John Leslie, 4,112,849, Cl. 102-103.000.

California Microwave, Inc.: *See—*
Minnis, Thomas R., B 738,835, Cl. 333-14.000.

Call, David B. Meteorological measuring apparatus. 4,112,753, Cl. 73-170.00R.

Calmac Manufacturing Corporation: *See—*
MacCracken, Calvin Dodd, 4,112,921, Cl. 126-271.000.

Caloric Gesellschaft Fuer Apparatebau m.b.H: *See—*
von Linde, Robert; von Linde, Joachim; and Kurz, German, B 690,617, Cl. 431-352.000.

Cambio, Orlando D., Jr., to Respiratory Care, Inc. Container for sterile liquids. B 867,043, Cl. 215-1.00C.

Camden, James B.: *See—*
LaFitte, Larry L.; and Camden, James B., B 741,640, Cl. 428-284.000.

Cameron, Frank L., to Westinghouse Electric Corp. Composite sectionalized protective indicating-type fuse. B 622,279, Cl. 337-162.000.

Cameron, Gordon, to McGraw-Edison Company. Security locking system. B 777,050, Cl. 292-40.000.

Campbell, John A.: *See—*
Wagner, Wayne M.; and Campbell, John A., B 773,847, Cl. 285-322.000.

Campioni, Armando, to Indesit Industria Elettrodomestici Italiana S.p.A. Amplifying circuit. B 793,344, Cl. 330-267.000.

Campolmi, Stefano: *See—*
Alneri, Enzo; Bottaccio, Giorgio; Campolmi, Stefano; and Cassar, Luigi, B 816,919, Cl. 568-716.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Laviolette, Maurice A., 4,112,843, Cl. 102-7.600.

Canadian Patents and Development Limited: *See—*
Clarke, Michael R.; and Dolenko, Allan J., B 752,628, Cl. 260-17.500.
MacLennan, P. H. Barry; Ireland, Graham A.; and Werba, William J., 4,112,756, Cl. 73-181.000.

Canon Kabushiki Kaisha: *See—*
Sone, Yoshiaki; Sawada, Takamasa; and Shirai, Masanari, B 806,515, Cl. 355-45.000.
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, B 736,223, Cl. 352-194.000.
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Shimizu, Masami; Yoshikawa, Ryoichi; and Aizawa, Hiroshi, B 758,200, Cl. 354-238.000.
Tsuji, Sadahiko; and Agari, Yujiro, B 857,692, Cl. 350-184.000.
Tsunekawa, Tokuichi; and Taguchi, Tetsuya, B 703,962, Cl. 250-214.00R.

Cantrell, Clifford J., Jr., to John Zink Company. Waste heat boiler temperature control system. B 789,939, Cl. 165-40.000.

Carl Freudenberg, Firma: *See—*
Schafer, Werner; Buchwald, Holger; and Bischoff, Dieter, B 637,488, Cl. 428-220.000.

Carlisle, Richard S. Series filled containers. B 714,746, Cl. 229-53.000.

Carlson, David H. J., to UOP Inc. Process for treating a sour petroleum distillate with anion exchange resin and with metal phthalocyanine catalyst. B 799,825, Cl. 208-206.000.

Carlson, David L., to Renco Corporation. Ultrasonic detector with audible indication signal. 4,112,927, Cl. 128-2.00V.

Carlson, Donald E., to Mark Controls Corporation. Ejector purge hydrant. 4,112,966, Cl. 137-282.000.

Carlson, Emery J.: *See—*
Pieters, Wim J. M.; and Carlson, Emery J., B 791,767, Cl. 252-438.000.

Carlson, Roger L., to Raygo, Inc. Uniaxial variable vibratory force generator. B 807,833, Cl. 173-49.000.

Carlsson, Lars Christer, to Tetra Pak International AB. Opening arrangement for packing containers. B 808,690, Cl. 206-611.000.

Carn, Patrick. Navigation harnesses. 4,112,865, Cl. 114-270.000.

Carol, John A., Jr.; and McAlindon, Harold P., to General Motors Corporation. Mileage indicator. B 845,959, Cl. 235-96.000.

Carrera, John P.: *See—*
Fidler, Gary L.; Hill, Richard A.; and Carrera, John P., B 686,858, Cl. 176-38.000.

Carrier Corporation: *See—*
Liberman, Harvey W.; and Whitehead, James Stephen, 4,112,823, Cl. 91-36.000.

Carson, John C., Jr.; Robbins, Clarence R.; and Kenkare, Divaker B., to Colgate-Palmolive Company. Applicator. 4,112,536, Cl. 15-104.940.

Carstens, Dennis L., to Becton, Dickinson and Company. Medical instrument package. B 824,412, Cl. 206-365.000.

Carter, Ian T. Chord locater for stringed musical instruments. 4,112,805, Cl. 84-317.000.

Carter, Michael Charles; Steer, Philip James, to National Research Development Corporation. Apparatus for indicating uterine activity in labor. B 757,024, Cl. 364-415.000.

Casalis, Jean-Arnaud; Teil, Yves; and Motte, Raymond, to Societe Miniere et Metallurgique de Penarroya. Flotation apparatus with mechanical agitation. B 713,371, Cl. 210-219.000.

Casio Computer Co., Ltd.: *See—*
Nakano, Harumi, B 654,725, Cl. 350-332.000.

Cassar, Luigi: *See—*
Alneri, Enzo; Bottaccio, Giorgio; Campolmi, Stefano; and Cassar, Luigi, B 816,919, Cl. 568-716.000.

Castelnuovo, Lucio: *See—*
Modena, Mario; Massardo, Pietro; and Castelnuovo, Lucio, B 695,748, Cl. 260-31.8HA.

Castilla, Antonio Jose. Gun lead sight. 4,112,583, Cl. 33-261.000.

Cataldo, Roy S., to General Motors Corporation. Variable displacement reciprocating piston machine. 4,112,826, Cl. 92-13.100.

Catallo, Frank. Method of padding and extracting a continuously advancing circular knit fabric tube. 4,112,532, Cl. 8-151.000.

Caterpillar Tractor Co.: *See—*
Bianchetta, Donald Louis, 4,112,821, Cl. 91-6.000.
Cole, Carroll Richard, B 735,245, Cl. 172-781.000.
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., B 733,562, Cl. 428-565.000.
Logsdon, John S.; and Meiner, George H., III, 4,112,718, Cl. 70-159.000.
Muntjanoff, John R., B 554,936, Cl. 214-147.00G.
Richardson, Warner G.; and Wilson, Eugene M., B 826,576, Cl. 280-154.50R.

Cavalier, Jean-Claude: *See—*
Chornet, Esteban; and Cavalier, Jean-Claude, B 811,438, Cl. 252-422.000.

Cavalleri, Bruno; and Volpe, Giancarlo, to Gruppo Lepetit S.p.A. 2-Nitroimidazole derivatives. B 759,697, Cl. 548-339.000.

Cavitron Corporation: *See—*
Burns, Henry L., 4,112,931, Cl. 128-2.080.
Cebal: *See—*
Berthet, Andre, B 757,135, Cl. 220-74.000.
Cecchini, Jack. Stringed musical instrument. 4,112,804, Cl. 84-173.000.
Celanese Corporation: *See—*
Kalnin, Ilmar L.; and Breckenridge, George J., B 759,927, Cl. 260-857.0TW.
Patella, Ralph F.; and Kuzma, Edward J., B 856,829, Cl. 156-327.000.
Rybny, Charles B.; Trebellas, John C.; and Sargent, Donald E., B 568,216, Cl. 204-159.160.
Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie: *See—*
Pirlet, Robert Alfred, 4,112,763, Cl. 73-355.00R.
Cesca, Sebastiano; Priola, Aldo; and Ferraris, Giuseppe, to Snam Progetti, S.p.A. Process for the preparation of linear alpha-olefin oligomers, subsequent hydrogenation thereof and saturated products thus obtained. B 795,225, Cl. 260-683.15B.
Cesca, Sebastiano: *See—*
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, B 775,776, Cl. 260-875.000.
CF Industries, Inc.: *See—*
Loughrie, Gregory D., B 834,281, Cl. 241-15.000.
Chadwick-Helmuth Company, Inc.: *See—*
Chadwick, James R., 4,112,774, Cl. 73-455.000.
Chadwick, James R., to Chadwick-Helmuth Company, Inc. Aircraft rotor out-of-track correction method and apparatus. 4,112,774, Cl. 73-455.000.
Chambers, Norman T.: *See—*
Glaudel, Stephen P.; and Chambers, Norman T., B 735,718, Cl. 322-38.000.
Chambley, Phillip W.: *See—*
Norris, Alan H.; and Chambley, Phillip W., 4,112,561, Cl. 28-243.000.
Champion International Corporation: *See—*
Hartman, Seymour, B 791,565, Cl. 428-529.000.
Norris, Alan H.; and Chambley, Phillip W., 4,112,561, Cl. 28-243.000.
Wright, John T., B 753,647, Cl. 192-129.00B.
Champion Spark Plug Company: *See—*
Abair, Raymond L.; and Kulish, Stanley J., Jr., B 784,044, Cl. 261-81.000.
Champlin, Harry C., Jr.: *See—*
Simmons, Kenneth C.; Champlin, Harry C., Jr.; Livorsi, Carl F.; and Wucik, Joseph A., Jr., B 797,921, Cl. 277-168.000.
Chandley, George D., to Hitchiner Manufacturing Co., Inc. Metal casting. 4,112,997, Cl. 164-119.000.
Chang, Nuke Ming; Remkes, Elmer R.; and Cook, William, Jr., to Santa Fe International Corp. Sea sled for entrenching pipe. 4,112,695, Cl. 405-163.000.
Chapin, Leonard Lee; and Merrick, James Walter, to Autotronic Controls, Corp. Fuel system with metering pump for internal combustion engines. 4,112,901, Cl. 123-139.00E.
Chapman, Richard D.; Holmer, Donald A.; and Mortimer, George A., to Monsanto Company. Melt preparation of 6TA/6IA polymers with phosphorus compound to reduce ammonia formation. B 759,313, Cl. 528-313.000.
Charlson, David V.: *See—*
Anderson, Leroy E.; Charlson, David V.; and Vierkant, Mark A., 4,112,731, Cl. 72-320.000.
Chateau, Louis Jean, to Ducellier et Co. Automatic spark timing device. 4,112,887, Cl. 123-117.00D.
Chatterjee, Pallab K.: *See—*
Fu, Horng-sen; Holloway, Thomas C.; Tasch, Al F., Jr.; and Chatterjee, Pallab K., 4,112,575, Cl. 29-577.00C.
Chem-tronics, Inc.: *See—*
Brimm, Daniel J., B 785,168, Cl. 156-639.000.
Chemische Fabrik Stockhausen & Cie: *See—*
Hubner, Wolfgang; Barthell, Eduard; and Dahmen, Kurt, B 682,543, Cl. 260-29.4UA.
Chemithon Corporation, The: *See—*
Brooks, Burton; and Brooks, Richard J., B 746,242, Cl. 422-193.000.
ChemPar Corporation: *See—*
Kang, Pierson S., 4,112,827, Cl. 93-58.300.
Chen, Kon S.; and Majewski, Helmut W., to Stauffer Chemical Company. Disposal of heavy metal containing sludge wastes. B 838,510, Cl. 106-97.000.
Cheron, Jacques, to Institut Francais du Petrole. Fuel cell including at least one improved element. B 727,804, Cl. 429-36.000.
Chevron Research Company: *See—*
Kurkov, Victor P., B 750,310, Cl. 260-326.5FL.
Miller, Stephen J., B 773,995, Cl. 208-254.00R.
Mulaskey, Bernard F., B 727,488, Cl. 208-244.000.
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., B 811,504, Cl. 148-23.000.
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., B 811,505, Cl. 148-23.000.
Tamm, Paul Whitfield, B 496,788, Cl. 252-465.000.
Wall, Robert G., B 790,366, Cl. 252-473.000.
Chiaramonte, Gasper, Jr. Dynamically illuminated footwear. 4,112,601, Cl. 36-137.000.
Chicago Fire Brick Company: *See—*
Rechter, Harold L., B 770,117, Cl. 106-67.000.
Chikamori, Kunio, to Agency of Industrial Science and Technology. Method for electrochemical machining. B 833,862, Cl. 204-129.100.
Childers, Aubrey C.: *See—*
Malinski, Richard F.; and Childers, Aubrey C., B 761,596, Cl. 318-475.000.
Children's Memorial Hospital, The: *See—*
Schulman, Jerome L.; and Kaplan, Jay, 4,112,926, Cl. 128-2.00S.
Chinery, Jack Joseph, to RCA Corporation. Method of testing semiconductor devices. B 790,199, Cl. 324-158.00D.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See—*
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, B 728,459, Cl. 424-251.000.
Chiulli, Robert D. Radiographic cassette adapter. B 795,093, Cl. 250-468.000.
Chiulli, Robert D. Laparoscopic cannula. 4,112,932, Cl. 128-3.000.
Chloride Group Limited: *See—*
McBrien, Roderick Julian, B 825,718, Cl. 429-99.000.
Choay S.A.: *See—*
Estevenel, Yvette Fr. M. J.; Thely, Maurice H.; and Coulon, Wladimir A., B 767,885, Cl. 264-113.000.
Choinski, Edward J., to Polaroid Corporation. Method of multilayer coating. B 801,144, Cl. 427-420.000.
Chornet, Esteban; and Cavalier, Jean-Claude, to Universite de Sherbrooke. Manufacture of a metal impregnated carbon from peat material. B 811,438, Cl. 252-422.000.
Chow, Philip Y., to Lin Offshore Engineering, Inc. Method of producing and installing offshore structures. 4,112,697, Cl. 405-209.000.
Christian, Donald K. Fabric bulking process. 4,112,558, Cl. 26-18.500.
Christy, Mark H.; and Spencer, Lloyd. Flush-drip irrigation emitter. B 708,062, Cl. 239-109.000.
Chrtek, Milan; Gabler, Josef; Tuma, Frantisek; Kasparek, Karel; and Blasko, Jan, to Vyzkumny ustav bavlnarsky. Method of and apparatus for cooling spinning units of open-end spinning machines. 4,112,663, Cl. 57-58.890.
Chulkova, Anna Davydovna: *See—*
Ivanov, Valentin Nikolaevich; and Chulkova, Anna Davydovna, B 668,185, Cl. 106-38.350.
Ciba-Geigy Corporation: *See—*
Deiner, Hans; Mosch, Franz; and Bernheim, Willy, B 554,819, Cl. 544-196.000.
Loew, Peter; and Koller, Stefan, B 676,599, Cl. 260-147.000.
Siegrist, Adolf Emil; and Pauchard, Jean-Paul, B 850,861, Cl. 542-463.000.
Siegrist, Adolf Emil; and De Sousa, Bernardo, B 851,040, Cl. 542-464.000.
Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, B 806,044, Cl. 521-108.000.
Cigliano, Irving Louis, to Marine Moisture Control Co., Inc. Cam lock with vertical plunger. B 784,702, Cl. 151-54.000.
Cimarusti, Christopher M.: *See—*
Varma, Ravi K.; and Cimarusti, Christopher M., B 850,514, Cl. 260-239.55R.
Cimarusti, Christopher Michael: *See—*
Hauck, Frederic Peter; and Cimarusti, Christopher Michael, B 446,837, Cl. 544-380.000.
Cincinnati Electronics Corporation: *See—*
Raab, Frederick Herbert, B 710,298, Cl. 343-105.00R.
Cincinnati Milacron-Heald Corp.: *See—*
Uhtenwoldt, Herbert R.; and Humes, Norman S., 4,112,624, Cl. 51-5.00D.
Citizen Watch Co., Ltd.: *See—*
Kato, Yoshiaki; and Motoki, Jinro, 4,112,671, Cl. 58-23.00D.
Claesson, Harry; and Hellgren, Keijo, to ASEA Aktiebolag. Transportation units for supporting and moving plate-formed attachment member into and out of a press stand of hydraulic press. 4,112,724, Cl. 72-63.000.
Clairol, Inc.: *See—*
Walter, Henry J., B 824,239, Cl. 366-111.000.
Clapp, Porter B. Two-piece tube plug for repairing tubes in heat exchangers and the like. B 764,520, Cl. 165-76.000.
Clark, Arthur E.: *See—*
Hudson, George Elbert, III; and Clark, Arthur E., 4,112,699, Cl. 62-3.000.
Clark, George M. Drilling jar. B 788,625, Cl. 175-300.000.
Clark, James A.; Livesey, Donald V.; and Wrue, Richard J., to Bausch & Lomb Incorporated. Apparatus for forming optical lenses. B 762,221, Cl. 249-105.000.
Clark, John A.: *See—*
Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., 4,112,952, Cl. 128-418.000.
Clark, Judith Ann, to Beecham Group Limited. Esters of derivatives of 1,1-diphenyl-3-amino-propan-2-ol. B 698,091, Cl. 560-250.000.
Clark, Steven D.: *See—*
Benham, Harold L.; Clark, Steven D.; Huffman, Hubert L.; and Stovall, Ronald J., B 806,799, Cl. 320-39.000.
Clarke, Michael R.; and Dolenko, Allan J., to Canadian Patents and Development Limited. Methylolated kraft lignin polymer resin. B 752,628, Cl. 260-17.500.
Clelland, John J. Pre-cast insulated wall structure. 4,112,646, Cl. 52-372.000.
Clemens, George Selden: *See—*
Hulka, Jaroslav Fabian; and Clemens, George Selden, 4,112,951, Cl. 128-346.000.

Clement, Clyde H. Vehicle top loading mechanism. B 828,503, Cl. 214-450.000.

Clement, George Frederick; and Sniegowski, Bruno Raymond, to Bell Telephone Laboratories, Incorporated; and Western Electric Company. Telephone controlled lock release arrangement. B 844,377, Cl. 179-2.00A.

Climet Instruments Company: *See*—
Lepper, James M., Jr., B 725,027, Cl. 356-103.000.

Clokey, Arthur C. Reinforced articles of elastomeric material. 4,112,614, Cl. 46-151.000.

Cluett, Peabody & Co., Inc.: *See*—
Troope, Walter S.; and Lawrence, Jackson, 4,112,559, Cl. 26-18.600.

Coates, David; Gray, George William; and McDonnell, Damien Gerard, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystalline materials. B 821,146, Cl. 252-299.000.

Cohen, Choua; and Sillion, Bernard, to Institut Francais du Petrole. Alkyl-guanidino-heterocyclic compounds, their manufacture and use as additives for fuels and lubricants. B 821,054, Cl. 252-51.50A.

Cohen, Michael Robert; Kierstead, Richard Wightman; and Tilley, Jefferson Wright, to Hoffmann-La Roche Inc. 1-(2-Aminoethyl)-3-(2,6-dihalophenyl)guanidines. B 844,570, Cl. 260-565.000.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Synthesis of optically active vitamin E. B 797,712, Cl. 260-340.90R.

Cohu, Inc.: *See*—
Wind, Walter Jamison, B 835,242, Cl. 220-319.000.

Cola, Rudolph A.: *See*—
Maloney, Thomas C.; and Cola, Rudolph A., B 685,526, Cl. 340-343.000.

Colburn, John W., Jr.: *See*—
Melton, Rosser B., Jr.; Colburn, John W., Jr.; and Wood, Charles D., III, B 515,310, Cl. 299-13.000.

Colby, Donald B., to Scott Paper Company. Foldable furniture unit. 4,112,855, Cl. 108-159.000.

Cole, Carroll Richard, to Caterpillar Tractor Co. Motor grader with draw bar and circle support structure. B 735,245, Cl. 172-781.000.

Cole, Lawrence S.; Cole, Ruth J.; and Facchini, Rigo. Apparatus for successively dispensing from a can of a jellied product slices of a cross sectional area less than that of the can. 4,112,800, Cl. 83-411.00A.

Cole, Martin; Hood, John Dick; and Butterworth, Dennis, to Beecham Group Limited. Antibiotic mm 13902. B 717,334, Cl. 424-117.000.

Cole, Ruth J.: *See*—
Cole, Lawrence S.; Cole, Ruth J.; and Facchini, Rigo, 4,112,800, Cl. 83-411.00A.

Colgate-Palmolive Company: *See*—
Carson, John C., Jr.; Robbins, Clarence R.; and Kenkare, Divaker B., 4,112,536, Cl. 15-104.940.
Kenkare, Divaker B.; and Shumway, Durland K., B 557,561, Cl. 424-46.000.

Colglazier, Donald Francis; Fallon, John Leslie; Kollar, Ernest Paul; and Mares, Fred Ralph, to International Business Machines Corporation. Combing wheel feed nip with second sheet restraint. B 788,570, Cl. 271-10.000.

Collignon, Herbert E.: *See*—
Godwin, Robert H.; and Collignon, Herbert E., B 764,371, Cl. 248-400.000.

Collin, Alvaro L.; and Patel, Gordhan M., to Kaiser Steel Corporation. Mine roof support plate. 4,112,693, Cl. 405-132.000.

Collin, Herbert S. Container for cut flowers. B 788,333, Cl. 206-423.000.

Collins, David John: *See*—
Shephard, Margaret Claire; Sugavanam, Balsubramanyan; Worthington, Paul Anthony; Collins, David John; and Griffin, David, B 750,017, Cl. 71-92.000.

Collins, Donald L.; and Downing, Harold A., to Collins Industries, Inc. Pin release device for a wheelchair lift. B 824,533, Cl. 214-75.00R.

Collins Industries, Inc.: *See*—
Collins, Donald L.; and Downing, Harold A., B 824,533, Cl. 214-75.00R.

Collins, John D.; and Jones, Trevor E., to Albright & Wilson Ltd. Process for preparing organotin halides. B 781,118, Cl. 260-429.700.

Collins, Joseph C.: *See*—
Surrey, Alexander R.; and Collins, Joseph C., B 831,942, Cl. 260-558.00D.

Collins, Michael H., to Shell Internationale Research Maatschappij, B.V. Method of applying a layer of polyurethane foam onto a cut or ground surface of polyurethane foam. B 693,273, Cl. 427-236.000.

Collins, Walter; and Blankumsee, Howard. Composite railroad cross tie with rail support blocks. B 785,834, Cl. 238-72.000.

Combette, Marc; Dorgnon, Roger; Luthringer, Jean; and Ollivier, Jean. Fastening tool using caseless munition. B 805,663, Cl. 227-10.000.

Combette, Marc; and Ollivier, Jean. Loading device for a power actuated tool. 4,112,685, Cl. 60-634.000.

Commissariat a l'Energie Atomique: *See*—
Melnick, Igor, B 797,849, Cl. 13-22.000.

Commonwealth Scientific and Industrial Research Organization: *See*—
Wild, John Paul, B 753,383, Cl. 343-754.000.

Communications Satellite, Corporation: *See*—
Horna, Otakar Anthony, B 814,942, Cl. 179-170.200.

Con-Spec Devices Inc.: *See*—
Walski, Stanley, B 782,877, Cl. 249-216.000.

Condon, Michael Edward: *See*—
Ondetti, Miguel Angel; and Condon, Michael Edward, B 759,685, Cl. 260-112.50R.

Conger, William H.; and Gehringer, Ronald F., to Nordica International, Inc., a part interest. Tamper-proof axial tumbler type lock. 4,112,820, Cl. 70-363.000.

Conrad, Jens; and Bruns, Klaus, to Henkel Kommanditgesellschaft auf Aktien. 2,4-Dioxa-spiro(5,5)undec-8-ene perfume compositions. B 765,531, Cl. 252-522.000.

Construction Specialties, Inc.: *See*—
Reifsnyder, Howard B., 4,112,640, Cl. 52-177.000.

Contraves AG: *See*—
Brandestini, Marco, 4,112,740, Cl. 73-53.000.

Conway, Terry T.: *See*—
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., B 760,620, Cl. 544-105.000.

Cook, Edward H., Jr.: *See*—
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., B 850,194, Cl. 429-33.000.

Cook, Glenn; and Larson, Paul, to Kennecott Copper Corporation. Method and apparatus for the electrolytic recovery of metal employing electrolyte convection. B 845,128, Cl. 204-105.00R.

Cook, John Gerald; and Shaw, Julian David, to Solartron Electronic Group Ltd., The. Long scale display. B 611,037, Cl. 324-115.000.

Cook, Robert E., to A. O. Smith Corporation. Flue pipe anode ring for water heater. B 789,643, Cl. 204-197.000.

Cook, William, Jr.: *See*—
Chang, Nuke Ming; Remkes, Elmer R.; and Cook, William, Jr., 4,112,695, Cl. 405-163.000.

Cooke, Charles M.: *See*—
Mazdiyasni, Khodabakhsh S.; and Cooke, Charles M., B 452,038, Cl. 264-101.000.

Coons, Robert R.; Hennessey, Richard G.; and Woffenden, John, to International Harvester Company. Cooling fluid circulation in an annular disc brake. B 811,499, Cl. 188-71.600.

Corfield, John Courtney, to Unimax Switch Limited. Electrical switch having interlock between door and switch. B 727,849, Cl. 200-50.00A.

Coriden, Paul. Collapsible electronic calculator stand. B 804,782, Cl. 248-13.000.

Corning Glass Works: *See*—
Sullivan, Kevin J., 4,112,925, Cl. 128-2.00F.

Corse, Kenneth J. Open end baking pan. B 805,275, Cl. 249-169.000.

Cosack, Claus: *See*—
Hein, Wolfgang; Grundmann, Peter; and Cosack, Claus, B 783,714, Cl. 222-396.000.

Cosh, Harry Jose. Apparatus for producing motion of a workpiece. 4,112,784, Cl. 74-501.50R.

Costales, Manuel; and Hakki, Moustafa I. Compensating drive for revolving rings. 4,112,666, Cl. 57-105.000.

Cotten, Roger C.; Young, David W.; and Kandanian, Aram Y., to Southern Chemical Company. Compositions comprising polybutene EPDM and polyolefin. B 851,764, Cl. 260-897.00A.

Coulon, Wladimir A.: *See*—
Estevenel, Yvette Fr. M. J.; Thely, Maurice H.; and Coulon, Wladimir A., B 767,885, Cl. 264-113.000.

Coutant, Ralph W., to Litton Systems, Inc. Keeper for idler rolls. 4,112,571, Cl. 29-243.500.

Coval, Arthur B.: *See*—
Lee, Arthur L.; and Coval, Arthur B., B 702,396, Cl. 192-4.00A.

Covington, Wayne L.; and Green, Glen R., to Ore-Ida Foods, Inc. Method and apparatus for forming torn, random size pieces of sausage meat. 4,112,545, Cl. 17-45.000.

Covini, Romano: *See*—
Padovan, Mario; De Alberti, Giordano; Battiston, Giancarlo; and Covini, Romano, B 734,248, Cl. 562-534.000.

Cowley, Brian Richard: *See*—
Laundon, Brian; Cowley, Brian Richard; and Humber, David Cedric, B 749,300, Cl. 204-158.0HA.

Cox, Donald E., to Coxwells, Incorporated. Swivel coupling. B 747,660, Cl. 285-174.000.

Coxwells, Incorporated: *See*—
Cox, Donald E., B 747,660, Cl. 285-174.000.

CPC International Inc.: *See*—
Leach, Harry Woods; Hebeda, Ronald Emil; and Holik, Dennis John, B 721,926, Cl. 127-29.000.

Craft, Jacob A.; and Hauser, Hans. Small transmission with brake. B 800,932, Cl. 188-72.700.

Cragoe, Edward J., Jr.: *See*—
Smith, Robert L.; Stokker, Gerald E.; and Cragoe, Edward J., Jr., B 833,930, Cl. 424-303.000.

Craig, Robert Simpson, to Acme Resin Corporation. Shell sand with improved thermal shock resistance. B 694,426, Cl. 428-404.000.

Cramer Industries, Inc.: *See*—
Wehner, Norvin J., deceased, B 801,055, Cl. 248-408.000.

Creager, John E.: *See*—
Sutton, Stephen J.; Holen, J. Robert; and Creager, John E., B 854,711, Cl. 338-33.000.

Crosby, Thomas C.: *See*—
Robinson, John William; Crosby, Thomas C.; and Howell, Stephen Louis, 4,112,802, Cl. 84-1.010.

Cross, Raymond Peter, to Pilkington Brothers Limited. Thermal treatment of glass in a fluidized bed. B 849,632, Cl. 65-114.000.

Csanady, Michael, Jr., to Westinghouse Electric Corp. Dual strainer gate arrangement for turbine oil systems. B 749,555, Cl. 210-167.000.

Csanady, Michael, Jr., to Westinghouse Electric Corp. Valving apparatus. 4,112,975, Cl. 137-625.290.

Culbertson, Harry M., to Monsanto Company. Process for preparing high ortho novolac resins. B 758,370, Cl. 528-138.000.

Curfman, Brainerd, Harris, Bell, Weigans and Depew: *See*—
Sanford, Dale J., 4,112,578, Cl. 29-700.000.
Curtice, Walter Richard, to RCA Corporation. Triggered burst generator. B 792,418, Cl. 307-260.000.
Curtis, Little P.: *See*—
Albaric, Jacques E.; Curtis, Little P.; and Dailey, George F., B 720,332, Cl. 310-54.000.
Curtis, William M.; and Hermanson, Dean E., to Youngstown Sheet and Tube Company. Pipe coupler for various size flanges. B 790,963, Cl. 285-12.000.
Custom Plastics, Inc.: *See*—
Tisbo, Cosmo N.; and Tisbo, Thomas A., 4,112,853, Cl. 108-111.000.
Cutler, Ivan B.: *See*—
Virkar, Anil V.; Miller, Mark L.; Cutler, Ivan B.; and Gordon, Ronald S., B 788,572, Cl. 429-193.000.
Cvacho, Daniel S., to Belgium Tool & Die Co. Coating filter, separator and collector system. B 727,447, Cl. 55-319.000.
Cycle-Kamp Inc.: *See*—
Olmstead, William Dean, B 735,429, Cl. 296-23.00H.
Cyphelly, Ivan Jaroslav. Valve arrangement for limiting torque of a hydraulic motor of a centrifuge. B 786,844, Cl. 233-7.000.
Czerwon, Dieter: *See*—
Schippers, Heinz; Hensen, Friedhelm; Koslowski, Gerhard; and Czerwon, Dieter, B 722,558, Cl. 526-351.000.
Dadurian, Aram; and Rehder, Gunther. Knee-joint prosthesis. 4,112,522, Cl. 3-1.910.
Daenen, Bernardus, to Van der Molen Machinefabriek B.V. Cutting apparatus. 4,112,799, Cl. 83-409.000.
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., to Hooker Chemicals & Plastics Corp.; and RAI Research Corporation. Trifluorostyrene sulfonic acid membranes. B 850,194, Cl. 429-33.000.
Dahmen, Kurt: *See*—
Hubner, Wolfgang; Barthell, Eduard; and Dahmen, Kurt, B 682,543, Cl. 260-29.4UA.
Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Mori, Shigeo; and Fujita, Takeshi, B 616,722, Cl. 521-163.000.
Dai Nippon Toryo Co., Ltd.: *See*—
Tugukuni, Hideyoshi; and Kano, Masafumi, B 683,508, Cl. 428-407.000.
Daido Tokushuko Kabushiki Kaisha: *See*—
Watanabe, Kazuo; Endo, Toshio; and Kojima, Katsuhiro, 4,112,626, Cl. 51-35.000.
Daihatsu Diesel Manufacturing Co., Ltd.: *See*—
Kagiyama, Yasuo; and Miyazaki, Nobumasa, B 793,359, Cl. 236-12.00A.
Dailey, George F.: *See*—
Albaric, Jacques E.; Curtis, Little P.; and Dailey, George F., B 720,332, Cl. 310-54.000.
Daimler-Benz Aktiengesellschaft: *See*—
Hufendiek, Ernst-Wilhelm, 4,112,897, Cl. 123-139.0ST.
Kohler, Werner; Drucker, Gerhard; Kiess, Ulrich; and Stotz, Manfred, B 717,682, Cl. 429-78.000.
Dairy Systems, Inc.: *See*—
Heidecker, Robert F., 4,112,758, Cl. 73-218.000.
D'Albora, John M., to United States of America, Navy. Determination of variations of wave characteristics. B 446,571, Cl. 340-3.00R.
Dale, Glenn H., to Phillips Petroleum Company. Separation of acetone from n-butane by distillation. B 669,539, Cl. 203-62.000.
Dale, John R.: *See*—
Mason, Russell I.; and Dale, John R., B 535,332, Cl. 340-85.000.
Dalziel, David G. Airborne rescue device. B 833,170, Cl. 244-137.00P.
D'Amato, Ralph James, to RCA Corporation. Process of fabricating a cathode ray tube. 4,112,562, Cl. 29-25.140.
Dany, Franz-Josef: *See*—
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; Auel, Theodor; and Kloss, Werner, B 815,160, Cl. 423-265.000.
D'Aragon, Paul. Insulating installation for a window frame. 4,112,642, Cl. 52-202.000.
Darby, Ronald L. Rebounding ball game. B 763,427, Cl. 273-95.00R.
Dare Pafco, Inc.: *See*—
Thurman, Paul G., B 796,478, Cl. 312-111.000.
d'Arras, Philippe, to Societe Coupax. Tenderizer for butcher's meat. 4,112,544, Cl. 17-25.000.
Das, Suryya K.: *See*—
Jozwiak, Edward L., Jr.; and Das, Suryya K., B 804,410, Cl. 204-181.00R.
Dasy Inter S.A.: *See*—
Brosow, Jorgen; and Furugard, Erik, B 647,935, Cl. 235-493.000.
Datrix Corporation: *See*—
Travis, Brian A., B 759,774, Cl. 340-151.000.
David, Gerard Andre: *See*—
Salles, Yvon; Leger, Pierre; and David, Gerard Andre, B 729,345, Cl. 156-345.000.
Davies, David Evan Naunton: *See*—
Denne, Phillip Raymond Michael; Davies, David Evan Naunton; and McEwen, Colin Dougal, B 723,621, Cl. 343-6.8LC.
Davis, Edward B. Motorized inverting exerciser with body guard permitting selection of desired stress. B 697,361, Cl. 272-93.000.
Davis, Edwin J. Window solar heating unit. 4,112,919, Cl. 126-270.000.
Davis, Gerald L.; and Scott, Timothy C., to Sundstrand Corporation. Reversing valve. 4,112,974, Cl. 137-625.290.
Davis, Harry Robert: *See*—
Stuart, Linden, Jr.; and Davis, Harry Robert, B 820,292, Cl. 156-392.000.
Davis, Pauls: *See*—
Helfert, Herbert; Davis, Pauls; and Langdon, William Keith, B 736,959, Cl. 260-615.00B.
Davis, Robert H., to United States of America, Navy. Digital signal synthesis system. B 639,031, Cl. 364-718.000.
Davoli, Velmore: *See*—
Mayr, Adolfo; Davoli, Velmore; Leccese, Antonio; and Susa, Ermanno, B 733,709, Cl. 252-429.00C.
Day, Frederick L. Travel insert chair and method of transporting the physically handicapped. B 800,434, Cl. 297-232.000.
Day, Paul B., to Gai-Tronics Corporation. Mine dial and page phone system. B 756,238, Cl. 179-2.00R.
Dayet, Jacques; Martin, Joseph; and Nicola, Charles, to Delle-Alsthom S.A. Gas-blast electric cut-out device. B 727,750, Cl. 200-148.00A.
De Dietrich (USA), Inc.: *See*—
Schlosberg, Seymour; and Lerman, Michael J., 4,112,572, Cl. 29-401.00R.
De Alberti, Giordano: *See*—
Padovan, Mario; De Alberti, Giordano; Battiston, Giancarlo; and Covini, Romano, B 734,248, Cl. 562-534.000.
Debat, Jacques, to Institut de Recherches Chimiques et Biologiques Appliquees. Compositions for the treatment of disorders of the prostate gland. B 673,915, Cl. 424-278.000.
DeBoer, Clarence; Dolak, Lester A.; and Peterson, Durey H., to Upjohn Company, The. Composition of matter and process. B 834,285, Cl. 424-117.000.
deBrebisson, Michel, to U.S. Philips Corporation. Method of manufacturing a semiconductor device by non-selectively implanting a zone of pre-determined low resistivity. B 764,587, Cl. 148-1.500.
De Castro Basto, Arthur Jose. Apparatus for teaching or practising bridge. 4,112,592, Cl. 35-8.00B.
Decca Limited: *See*—
Ilieve, Peter John, B 811,877, Cl. 358-34.000.
Deck, Howard C.: *See*—
Feltz, Albert J.; and Deck, Howard C., B 811,913, Cl. 352-159.000.
Decker, Lloyd Burr, to Harter Corporation. Snub assembly for securing covering material to a wall panel module. 4,112,643, Cl. 52-222.000.
Deckers, Albert T.: *See*—
Extra, Piet M. J.; Smeets, Lambertus R. J. M.; Van Bavel, Adrianus W. M.; Van Lieshout, Jacobus J.; and Deckers, Albert T., 4,112,870, Cl. 118-657.000.
de Cointet de Fillain, Paul: *See*—
Pigerol, Charles; de Cointet de Fillain, Paul; and Nanthavong, Souli, B 667,557, Cl. 260-326.160.
DeCorso, Serafino M., to Westinghouse Electric Corp. Hybrid combustor with staged injection of pre-mixed fuel. 4,112,676, Cl. 60-39.710.
DeCorso, Serafino M.: *See*—
Pillsbury, Paul W.; and DeCorso, Serafino M., 4,112,675, Cl. 60-39.060.
Deffner, John F.: *See*—
Bunting, Pamela M.; and Deffner, John F., B 751,256, Cl. 44-72.000.
Degremont: *See*—
Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, B 605,926, Cl. 204-180.00R.
Deguchi, Hidetaka; Kikuchi, Shoji; Wada, Hajime; Satoh, Shui; and Endo, Takaya, to Konishiroku Photo Industry Co., Ltd. Color photographic developing composition. B 656,084, Cl. 96-66.00R.
DeHart, John R.; Nelson, Larry L.; and Krehl, William H., to Docutronix, Inc. Device for checking envelopes for enclosed documents. B 775,386, Cl. 209-549.000.
Dehnert, Johannes; and Dunkelmann, Guenter, to BASF Aktiengesellschaft. Disperse azo dye with diaminopyrimidine coupling component. B 660,985, Cl. 260-154.000.
Deiner, Hans; Mosch, Franz; and Bernheim, Willy, to Ciba-Geigy Corporation. Addition products of an N-allylamino-s-triazine and an organopolysiloxane. B 554,819, Cl. 544-196.000.
de Kanter, Hendrik, to DKA, Inc. Glass cylinder subdividing apparatus and method. 4,112,627, Cl. 51-79.000.
Deknatel, Inc.: *See*—
Kurtz, Leonard D.; and Bidwell, Robert E., 4,112,948, Cl. 128-276.000.
Delalande S. A.: *See*—
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., B 813,357, Cl. 544-360.000.
Deli, Jack M., to International Harvester Company. Torsielastic thrust bushing for track chains. 4,112,574, Cl. 29-527.100.
Delle-Alsthom S.A.: *See*—
Dayet, Jacques; Martin, Joseph; and Nicola, Charles, B 727,750, Cl. 200-148.00A.
Del Monte, Louis A., to Honeywell Inc. Microcircuit device metallization. B 809,960, Cl. 204-15.000.
DeLorenzo, Mario M. Foldable saw horse. B 763,368, Cl. 182-153.000.
Demag, A.G.: *See*—
Gudenau, H. W.; Konig, Horst; Rath, Gero; and Roth, Haye, B 771,748, Cl. 75-12.000.
Demers, Robert Augustus, to Bell Telephone Laboratories, Incorporated. Selective calling circuit. B 716,581, Cl. 340-147.00R.
Denk, Joseph P.: *See*—
Ganske, Kingston; Hibbard, Earl R.; Falk, Mervin L.; and Denk, Joseph P., B 786,234, Cl. 360-99.000.
Denne, Phillip Raymond Michael; Davies, David Evan Naunton; and McEwen, Colin Dougal, to Alfa-Laval Company Limited. Passive

transponder apparatus for use in an interrogator-responder system. B 723,621, Cl. 343-6.8LC.

Denzene, Quentin S., to E. F. Johnson Company. Channel skip memory system for radio receiver. B 741,868, Cl. 325-470.000.

Denzene, Quentin S., to E. F. Johnson Company. Radio channel skip system. B 753,684, Cl. 325-470.000.

Denzer, Max; and Smith, Joseph A., to Sandoz, Inc. Process for the preparation of substituted isoxazolo[4,5-c]pyridin-4-(5H)-ones. B 790,896, Cl. 544-362.000.

de Putter, Warner Jan, to Wavin B.V. Process for perforating plastics tubes. 4,112,795, Cl. 83-15.000.

Derdzinski, Terrence Edmund; and Karlin, James Hilliard, to Motorola, Inc. Modular console enclosure with writing surface. B 620,987, Cl. 312-198.000.

DeRouen, Joseph Rodolph; and Kucharski, Lawrence, Jr., to Bourns, Inc. Worm gear potentiometer ratchet system. B 800,600, Cl. 338-174.000.

Derrwaldt, Philip A. Cable tension control. B 625,822, Cl. 254-175.700.

Deruelle, Jean, to Stein Industrie. Combustion of hot gases of low calorific power. B 760,140, Cl. 431-5.000.

Desai, Ardeshir R.: *See*—
Lammert, Wayne F.; Simpson, Dayton M.; and Desai, Ardeshir R., 4,112,698, Cl. 405-167.000.

Deshpande, Narayan V., to Xerox Corporation. Resilient lithographic masters for direct printing. 4,112,841, Cl. 101-141.000.

Desiderio, Angelo C., to Oak Industries, Incorporated. Low level relay contact blades. B 756,247, Cl. 200-246.000.

DeSimone, Robert Santora, to Polak's Frutal Works, Inc. Bleach compositions containing perfume oils. B 819,517, Cl. 252-187.00H.

DeSoto, Inc.: *See*—
Rabi, Rafat T.; Murphy, Edward J.; and Basoms, John A., B 745,240, Cl. 204-181.00C.
Sekmakas, Kazys, B 726,141, Cl. 260-850.000.

De Sousa, Bernardo: *See*—
Siegrist, Adolf Emil; and De Sousa, Bernardo, B 851,040, Cl. 542-464.000.

DeStephanis, Ralph, to RCA Corporation. Record support and alignment apparatus for a video disc player. B 801,728, Cl. 274-9.00B.

Detcher, Theodore E., to Black Clawson Company, The. Dewatering screen. B 799,555, Cl. 210-409.000.

Deutsch, Ralph, to Deutsch Research Laboratories, Ltd. Ensemble and anharmonic generation in a polyphonic tone synthesizer. 4,112,803, Cl. 84-1.240.

Deutsch Research Laboratories, Ltd.: *See*—
Deutsch, Ralph, 4,112,803, Cl. 84-1.240.

Deutsche Babcock Aktiengesellschaft: *See*—
Noack, Rolf; Schuster, Joachim; and Lohse, Udo, 4,112,728, Cl. 72-154.000.

Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler: *See*—
Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, B 802,946, Cl. 260-545.00R.
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, B 678,822, Cl. 260-348.250.

Deutsche Texaco Aktiengesellschaft: *See*—
Strehlke, Gunter; and Osterburg, Gunther, B 547,846, Cl. 260-593.00P.

De Vito, Vincent P.: *See*—
Moen, George E.; and De Vito, Vincent P., B 818,384, Cl. 219-10.55R.

DeWitt, James S.: *See*—
DeWitt, Stuart; and DeWitt, James S., 4,112,550, Cl. 24-73.0BP.

DeWitt, Stuart; and DeWitt, James S. Suspended ceiling hook. 4,112,550, Cl. 24-73.0BP.

Dey, Ervin J., to SPS Technologies, Inc. Grommet assembly. 4,112,993, Cl. 151-41.740.

Diagnostic Isotopes Incorporated: *See*—
Finn, James J., B 712,802, Cl. 206-528.000.

Diamalt Aktiengesellschaft: *See*—
Rambacher, Paul; and Make, Siegfried, B 831,053, Cl. 544-314.000.

Dickert, Yancey J.: *See*—
Miller, Stephen L.; and Dickert, Yancey J., B 754,730, Cl. 260-9.000.

Dickey-john Corporation: *See*—
Knepler, John T., 4,112,777, Cl. 73-728.000.

Diebold Incorporated: *See*—
Graef, Harry T.; Richardson, Jack M.; and Wolfarth, Robert P., B 761,288, Cl. 221-6.000.

Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., to Armstrong Cork Company. Curable aryloxyphosphazene polymers. B 878,679, Cl. 521-95.000.

Diehl, Harry Weldon. Method of treating rheumatoid arthritis. B 821,053, Cl. 424-312.000.

Dielectric Laboratories, Inc.: *See*—
Lupfer, David A., B 744,237, Cl. 333-84.00M.

Diesch, Robert E., to Pako Corporation. Knife assembly for photographic strip cutter. 4,112,801, Cl. 83-586.000.

Dietz, Raymond A. F.; Fundom, Danny L.; Henning, George J.; and McKinney, Lynn B., to Van Dorn Company. Tray-type processed food containers. B 744,965, Cl. 206-508.000.

Dillinger, Lester L. Apparatus for drilling or reaming. B 822,790, Cl. 408-226.000.

DiMola, Nunzio: *See*—
Winters, Giorgio; and DiMola, Nunzio, B 713,011, Cl. 260-288.0CF.

Dipsol Chemical Company, Ltd.: *See*—
Oshima, Kathuhide; Takasaki, Haruyuki; and Takahashi, Akio, B 779,560, Cl. 204-55.00Y.

Director-General Agency of Industrial Science and Technology: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.

Dirksing, Robert S.; and Todd, Estel R., to Procter & Gamble Company, The. Fluid injector. B 845,064, Cl. 366-167.000.

Discojet Corporation: *See*—
Moller, Paul S., B 728,913, Cl. 181-231.000.

Distillers Company (Carbon Dioxide) Ltd., The: *See*—
Wheldon, Alfred G.; and Harris, Ernest D., 4,112,736, Cl. 73-23.000.

Distler, Harry; Schlecht, Helmut; and Hartert, Erwin, to BASF Aktiengesellschaft. Manufacture of N-substituted glycinonitriles. B 743,517, Cl. 260-465.50A.

Dittmer, William H.: *See*—
Wycoff, Keith H.; and Dittmer, William H., B 598,587, Cl. 340-164.00R.

Dixon, William Paul. Power source for subsea oil wells. 4,112,687, Cl. 60-641.000.

DKA, Inc.: *See*—
de Kanter, Hendrik, 4,112,627, Cl. 51-79.000.

Dobson Park Industries Limited: *See*—
Jeffrey, Ian Campbell, B 617,088, Cl. 214-141.000.
Phillips, Reginald Andrew; Hamilton, Terence; and Thompson, Arthur David, B 734,637, Cl. 299-31.000.

Dr. C. Otto & Comp. G.m.b.H.: *See*—
Pries, Erich, B 747,381, Cl. 202-139.000.

Dr. Carl Hahn G.m.b.H.: *See*—
Friese, Axel; and Simon, Stefan, B 731,954, Cl. 198-480.000.

Documation Incorporated: *See*—
Bushman, Willard T.; and Snyder, Robert C., B 608,897, Cl. 235-474.000.

Docutronix, Inc.: *See*—
DeHart, John R.; Nelson, Larry L.; and Krehl, William H., B 775,386, Cl. 209-549.000.

Doerman, Eryk Stefan: *See*—
Preston, Edward George; and Doerman, Eryk Stefan, 4,112,954, Cl. 131-21.00R.

Doggett, Neil: *See*—
Lappage, James; Doggett, Neil; and Yates, Stephen William, 4,112,662, Cl. 57-34.0AT.

Doi, Kaname, to Sumitomo Electric Industries, Ltd. Load-responsive pressure proportioning reducing valve assembly for vehicle hydraulic brake system. B 804,572, Cl. 303-24.00F.

Dolak, Lester A.: *See*—
DeBoer, Clarence; Dolak, Lester A.; and Peterson, Durey H., B 834,285, Cl. 424-117.000.

Dolenko, Allan J.: *See*—
Clarke, Michael R.; and Dolenko, Allan J., B 752,628, Cl. 260-17.500.

Dolidze, Vladimir Romanovich: *See*—
Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Sobolev, Valerian Mikhailovich; Rutman, Grigory Iosifovich; Logutov, Igor Jurievich; and Dolidze, Vladimir Romanovich, B 788,590, Cl. 568-789.000.

Dominguez, Richard Lee. Lighting fixture. B 800,634, Cl. 362-35.000.

Donaldson Company, Inc.: *See*—
Wagner, Wayne M.; and Campbell, John A., B 773,847, Cl. 285-322.000.

Dondi, Gilberto; and Zanotti, Arnaldo, to Bayer Italia Societa per Azioni. Fruit juice-sugar granules. B 743,853, Cl. 424-230.000.

Donn Products, Inc.: *See*—
Mieyal, David F., B 803,078, Cl. 248-354.00R.

Donnelli, Joseph W.; and Barnes, Richard D., to Southern Imperial, Inc. Merchandizing system for use with perforated panels or the like. B 821,809, Cl. 211-49.00R.

Donner-Hanna Coke Corporation: *See*—
Mahar, Kevin D., B 635,594, Cl. 201-39.000.

Donner, Joseph E., to Unitek Corporation. Feedback-controlled radiant furnace for firing ceramic material and the like. B 602,208, Cl. 219-489.000.

Dooley, Richard A. Apparatus for producing cams. 4,112,819, Cl. 90-13.900.

Dore, James E., to Swiss Aluminium Ltd. Apparatus for the filtration of molten metal in a crucible type furnace. B 835,649, Cl. 266-227.000.

Dorgnon, Roger: *See*—
Combette, Marc; Dorgnon, Roger; Luthringer, Jean; and Ollivier, Jean, B 805,663, Cl. 227-10.000.

Dorogochinsky, Akivy Zinovievich: *See*—
Mirsky, Yakov Volfovich; Dorogochinsky, Akivy Zinovievich; Meged, Nelli Fillipovna; and Kosolapova, Antonina Pavlovna, B 710,651, Cl. 423-329.000.

Dorsey, Geoffrey A., Jr., to Kaiser Aluminum & Chemical Corporation. Method of forming an aluminum oxide coating. B 714,157, Cl. 148-6.270.

Doss, Richard C., to Phillips Petroleum Company. Process for applying sealant composition. B 794,893, Cl. 428-355.000.

Doss, Richard C.: *See*—
Louthan, Rector P.; and Doss, Richard C., B 737,948, Cl. 528-279.000.

Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter

A., to Hercules Incorporated. Copolymers of alpha-methylstyrene and styrene and uses thereof. B 636,340, Cl. 260-876.00B.
Douglas, Waymon Joe; and Douglas, Wilburn Cleatus. Article handling apparatus. B 743,787, Cl. 214-8.50C.
Douglas, Wilburn Cleatus: *See—*
Douglas, Waymon Joe; and Douglas, Wilburn Cleatus, B 743,787, Cl. 214-8.50C.
Dovzhko, Fedor Evdokimovich: *See—*
Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich, 4,112,702, Cl. 62-123.000.
Dow Chemical Company, The: *See—*
Johnson, David R., B 722,851, Cl. 204-64.00R.
Langhorst, Martin A.; Sinke, Gerard C.; and Mossner, Elmer H., B 746,981, Cl. 75-101.00R.
Miller, Stephen L.; and Dickert, Yancey J., B 754,730, Cl. 260-9.000.
Pickelman, Dale M., Sr.; and Wessling, Ritchie A., B 776,167, Cl. 526-30.000.
Strojny, Edwin J.; Friedli, Hans R.; and Wing, Milton S., B 828,409, Cl. 260-346.750.
Thompson, James L., B 713,168, Cl. 252-8.55C.
Trucks, Roger O.; and Steiner, Edwin C., B 437,425, Cl. 260-338.000.
Dowa Co., Ltd.: *See—*
Miyahara, Kingo, B 800,701, Cl. 431-122.000.
Dowa Mining Co., Ltd.: *See—*
Obinata, Shiro; Hashimoto, Shigeru; and Sahara, Takeshi, B 613,928, Cl. 209-167.000.
Downing, Harold A.: *See—*
Collins, Donald L.; and Downing, Harold A., B 824,533, Cl. 214-75.00R.
Downing, James H., Jr. All-electric A.C. tractor. B 769,378, Cl. 180-65.00C.
Doyle, Terrence W.: *See—*
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., B 760,620, Cl. 544-105.000.
Dragerwerk Aktiengesellschaft: *See—*
Jeretin, Stojan, 4,112,938, Cl. 128-142.00R.
Dravo Corporation: *See—*
Pietrusza, Arthur Jacob; and Kent, Harry James, B 709,427, Cl. 435-222.000.
Dreibelbis, Logan L., to Advanced Drainage Systems, Inc. Tube slotter. 4,112,810, Cl. 83-490.000.
Driscoll, John J.; and Wareham, Richard R., to Polaroid Corporation. Self-developing camera and viewer. B 749,511, Cl. 354-76.000.
Driscoll, Michael J.; and Bowman, Frank L., to Massachusetts Institute of Technology. Core catcher for nuclear reactor core meltdown containment. B 723,403, Cl. 176-38.000.
Drossbach, Hubert, to Agro-Drip, Incorporated. Drain pipe method. B 773,766, Cl. 264-154.000.
Drucker, Gerhard: *See—*
Kohler, Werner; Drucker, Gerhard; Kiess, Ulrich; and Stotz, Manfred, B 717,682, Cl. 429-78.000.
Dubois, Leo Francis. Trash can transporter. B 790,845, Cl. 248-146.000.
DuBosque, Clayton, Jr.; Rudd, Wallace C.; and Allen, Richard J., to Thermatool Corp. Method of manufacturing heat exchange panels. 4,112,566, Cl. 29-157.30C.
Ducellier et Cie: *See—*
Habert, Roger, 4,112,895, Cl. 123-117.00R.
Ducellier et Co.: *See—*
Chateau, Louis Jean, 4,112,887, Cl. 123-117.00D.
Duff, Ian David; Kennedy, John Hamilton; and Bunce, Roger Abraham, to Secretary of State for Social Services, The. Liquid storage device. B 712,164, Cl. 422-63.000.
Dufour, Raymond J.: *See—*
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., B 738,481, Cl. 165-3.000.
Duncan, Herbert Alan, to Motorola, Inc. Noise blanker circuit. B 810,215, Cl. 325-480.000.
Dunkelmann, Guenter: *See—*
Dehnert, Johannes; and Dunkelmann, Guenter, B 660,985, Cl. 260-154.000.
Dunlop Limited: *See—*
Mills, Anthony Mark; and Buck, David Lyndon, 4,112,994, Cl. 152-354.00R.
Dunn, Paul E.: *See—*
Slater, Charles E.; Dunn, Paul E.; and Mustain, Lewis B., B 722,741, Cl. 235-419.000.
Du Pont de Nemours, E. I., and Company: *See—*
Alegranti, Constance Wright, B 677,443, Cl. 210-500.00M.
Harmuth, Charles Moore, B 795,565, Cl. 260-28.50D.
Portnoy, Robert Charles, B 805,150, Cl. 544-408.000.
Resnick, Paul Raphael; and Grot, Walther Gustav, B 835,804, Cl. 204-98.000.
Durbin, John Alan, to Xerox Corporation. Optical system for alternatively projecting adjacent images of adjacent objects or double images of a single object. B 782,865, Cl. 353-122.000.
Dussich, Manlio V. Sunglass method and apparatus. B 820,570, Cl. 351-49.000.
Dy. Tampella AB: *See—*
Lehtinen, Jukka A., 4,112,586, Cl. 34-9.000.
Dyckerhoff & Widmann Aktiengesellschaft: *See—*
Herbst, Thomas, 4,112,637, Cl. 52-155.000.
Dynamit Nobel Aktiengesellschaft: *See—*
aus der Funten, Helmut; and Vogt, Wilhelm, B 783,576, Cl. 260-343.30R.
Blumenfeld, Georg; and Vollkommer, Norbert, B 640,312, Cl. 528-299.000.
Haage, Karl; and Scharff, Dieter, B 609,944, Cl. 428-111.000.
Helfgen, Werner; Lindner, Gerhard; Lingens, Paul; and Kaufmann, Helmut, B 702,593, Cl. 264-3.00R.
Kreuzburg, Gerhard; Lenz, Arnold; and Rogler, Walter, B 706,864, Cl. 260-448.80A.
Psencik, Erich, B 598,084, Cl. 528-75.000.
Dynapol: *See—*
Bellanca, Nicolo; and Furia, Thomas Edward, B 799,795, Cl. 106-137.000.
Dzyan, Valentin Ivanovich: *See—*
Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich, 4,112,702, Cl. 62-123.000.
E. F. Johnson Company: *See—*
Denzene, Quentin S., B 741,868, Cl. 325-470.000.
Denzene, Quentin S., B 753,684, Cl. 325-470.000.
E M I Limited: *See—*
Lee, Cyril Arthur, B 622,753, Cl. 235-449.000.
E. R. Squibb & Sons, Inc.: *See—*
Hauck, Frederic Peter; and Cimarusti, Christopher Michael, B 446,837, Cl. 544-380.000.
Ondetti, Miguel Angel; and Condon, Michael Edward, B 759,685, Cl. 260-112.50R.
Treuner, Uwe D.; and Breuer, Hermann, B 776,400, Cl. 544-26.000.
Varma, Ravi K.; and Cimarusti, Christopher M., B 850,514, Cl. 260-239.55R.
Eastman Kodak Company: *See—*
Lelental, Mark; and Light, William Andrew, B 824,136, Cl. 96-1.00R.
Sandhu, Mohammad Akram; and Tingler, Kenneth Lloyd, B 778,635, Cl. 96-67.000.
Ebeling, Martti Olavi Aladar; and Lunden, Risto Waldemar, to Kontekla Oy. Rain water roof outlet or similar for a building. 4,112,691, Cl. 405-119.000.
Ebihara, Masatomi; Inoue, Masahide; and Hidaka, Tsuneo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Sintered apatite body. B 802,856, Cl. 106-39.500.
Ecsery, Zoltan: *See—*
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, B 728,459, Cl. 424-251.000.
Edamoto, Yoshito. Temporary sealant of a nozzle opening of sliding nozzle. B 819,707, Cl. 106-56.000.
Eguchi, Tadashi: *See—*
Tanaka, Shinzo; Tsubamoto, Shinichi; Yamashita, Koichi; Eguchi, Tadashi; and Inoue, Kashirou, B 709,088, Cl. 23-232.00R.
Ehrhart, Leonard M.; Pratte, John R.; and Mazik, Paul E., Jr., to Pullman Incorporated. Adjustable thickness vent door assembly for cargo bodies. 4,112,621, Cl. 49-400.000.
Einerhand, Johan Jozef; Erkens, Leonardus Johannes Hubertus; Laenen, Rene Johannes; and Hoofs, Joseph Wilhelmus Jacobus, to Hercules Incorporated. Iron blue pigment composition and process for its production. B 809,336, Cl. 106-304.000.
Eisai Co., Ltd.: *See—*
Igarashi, Toshiji; and Nakajima, Yoshikage, B 821,910, Cl. 424-266.000.
Electric Machinery Mfg. Company: *See—*
Sandor, Leslie W., B 753,430, Cl. 219-137.00R.
Electric Power Research Institute, Inc.: *See—*
Brobeck, William M., 4,112,785, Cl. 74-572.000.
Holman, Robert R.; and Turkall, Daniel N., B 737,761, Cl. 277-1.000.
Sisk, Francis J.; and Veyo, Stephen E., 4,112,705, Cl. 62-238.000.
Electro-Sound, Inc.: *See—*
Rehklau, George D., B 738,899, Cl. 242-56.00R.
Electronics Corporation of America: *See—*
Cade, Phillip J., B 675,778, Cl. 431-78.000.
Electronics for Medicine, Inc.: *See—*
Feldman, Charles L.; and Hubelbank, Mark, 4,112,930, Cl. 128-2.06R.
Eley, Edgar R., to Westinghouse Electric Corp. Load break bushing. B 828,467, Cl. 339-111.000.
Ellington, Gordon H.; Mitchell, William O.; and Estapa, Don E., to Oxford Industries, Inc. Method of fabricating shirt cuffs. 4,112,860, Cl. 112-262.000.
Ellis, James Arthur: *See—*
Wright, Glenn Lamont; and Ellis, James Arthur, 4,112,540, Cl. 16-99.000.
Eltra Corporation: *See—*
Hayes, Clyde M., B 775,084, Cl. 310-241.000.
Lang, Roger J.; and Lang, Gary E., B 736,309, Cl. 339-29.00R.
Emerson Electric Co.: *See—*
Henderson, David L., B 663,146, Cl. 148-6.15Z.
EMI Limited: *See—*
Hounsfield, Godfrey Newbold, B 655,396, Cl. 250-445.00T.
LeMay, Christopher Archibald Gordon, B 781,961, Cl. 250-445.00T.
Oliver, Colin Charles, B 765,422, Cl. 250-445.00T.

Emmons, Marvin L. Convertible hat blocking structure. B 775,245, Cl. 223-24.000.
Empire Metal Products Corp.: *See—*
Stewart, David E., 4,112,622, Cl. 49-421.000.
Emura, Tomoyuki: *See—*
Sekihara, Takeshi; Emura, Tomoyuki; and Murashige, Masayuki, B 874,748, Cl. 526-74.000.
Enami, Shiroh: *See—*
Mukaemachi, Takuji; Takeshita, Tetsuo; and Enami, Shiroh, B 775,619, Cl. 179-18.0ES.
Endo, Takaya: *See—*
Deguchi, Hidetaka; Kikuchi, Shoji; Wada, Hajime; Satoh, Shui; and Endo, Takaya, B 656,084, Cl. 96-66.00R.
Endo, Toshio: *See—*
Watanabe, Kazuo; Endo, Toshio; and Kojima, Katsuhiro, 4,112,626, Cl. 51-35.000.
Enenkel, Hans-Joachim: *See—*
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, B 739,142, Cl. 424-205.000.
Energy Conversion Devices, Inc.: *See—*
Hallman, Robert W., B 205,861, Cl. 96-75.000.
Energy Research Inc.: *See—*
Harpman, Webster B., 4,112,889, Cl. 123-25.00B.
Engel, Lawrence J.; and Gardiner, John B., to Exxon Research & Engineering Co. Aminated polymeric additives for fuels and lubricants. B 493,328, Cl. 252-51.50R.
Engelhardt, Bernard H.; and Mintz, Marcus. Liquid level measuring apparatus. 4,112,761, Cl. 73-312.000.
Engineered Systems, Inc.: *See—*
Kubina, John, B 789,960, Cl. 340-149.00A.
Englund, Gosta Roland, to Svenska Dataregister Aktiebolag. Driving device for a print head. 4,112,840, Cl. 101-93.150.
Enlow, William Palmer: *See—*
Hechenbleikner, Ingenuin; and Enlow, William Palmer, B 795,461, Cl. 260-969.000.
Entoleter, Inc.: *See—*
Wattles, Gurdon B.; and Vecsey, Louis R., B 778,363, Cl. 241-188.00A.
Environmental Devices Corporation: *See—*
Kerfoot, William B.; and Brainard, Edward C., II, 4,112,741, Cl. 73-53.000.
Eppe, Rudolf; Schnall, Gunther; Mullritter, Ludwig; Beck, Johann; and Hartwig, Karl, to Agfa-Gevaert AG. Copying apparatus. B 699,341, Cl. 355-8.000.
Epstein, James Stephen, to Hewlett-Packard Company. Surveying instrument and method. B 742,941, Cl. 356-5.000.
Epstein, Max; Marhic, Michel E.; and Schacham, Samuel E., to Northwestern University. Apparatus and method for efficient synthesis of laser light. B 753,292, Cl. 331-94.50C.
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich. Process for the production of alumina from the mineral component of solid fuels. B 702,208, Cl. 423-131.000.
Erickson, John W.: *See—*
Brown, Francis Barton; and Erickson, John W., B 768,581, Cl. 55-203.000.
Eriksson, Lennart: *See—*
Schibbye, Hjalmar; and Eriksson, Lennart, 4,112,701, Cl. 62-84.000.
Erkens, Leonardus Johannes Hubertus: *See—*
Einerhand, Johan Jozef; Erkens, Leonardus Johannes Hubertus; Laenen, Rene Johannes; and Hoofs, Joseph Wilhelmus Jacobus, B 809,336, Cl. 106-304.000.
Ernst, Ludwig. Disperser head for seed and fertilizer drill machines. B 762,688, Cl. 222-139.000.
Ernsthausen, Roger E., to Owens-Illinois, Inc. Multiple gaseous discharge display/memory panel having improved voltage characteristics. B 293,817, Cl. 313-188.000.
ESB Incorporated: *See—*
Margalit, Nehemiah, B 851,414, Cl. 429-194.000.
Escher Wyss Limited: *See—*
Miller, Helmut, B 744,319, Cl. 308-9.000.
ESGE-MARBY GmbH & Co.: *See—*
Niemann, Heinz, B 776,421, Cl. 224-39.000.
Establissement Valvin: *See—*
Poinsard, Elisabeth Michele; and Poinsard, Robert Gaston, 4,112,829, Cl. 99-277.000.
Estapa, Don E.: *See—*
Ellington, Gordon H.; Mitchell, William O.; and Estapa, Don E., 4,112,860, Cl. 112-262.000.
Esters, Ernie B. Dynamoelectric machine with inner and outer stators. B 748,091, Cl. 310-46.000.
Estes, John H.: *See—*
Herbstman, Sheldon; Webb, Allen N.; and Estes, John H., B 746,766, Cl. 252-442.000.
Rao, Babu Y.; Nolan, John T., Jr.; and Estes, John H., B 774,099, Cl. 260-683.680.
Estes, Robert T.: *See—*
MacLean, Donald L.; and Estes, Robert T., B 699,543, Cl. 528-289.000.
Estevenel, Yvette Fr. M. J.; Thely, Maurice H.; and Coulon, Wladimir A., to Choay S.A. Process for the manufacture of layered tablets incorporating controlled release microcapsules. B 767,885, Cl. 264-113.000.
Etablissements Carpano & Pons: *See—*
Mazuir, Maurice, B 762,231, Cl. 364-900.000.
Evans, David H.; and Greenwald, Richard B., to Polaroid Corporation. Conversion of N-tosylsulfoximides to sulfoximines. B 784,669, Cl. 260-327.00M.
Evans Products Company: *See—*
Johnson, Peter E.; and Rowland, Bob G., B 604,350, Cl. 429-143.000.
Evans, Robert T.; and Farley, David L., to Halliburton Company. Reclosable circulation valve for use in oil well testing. B 846,232, Cl. 166-264.000.
Everett/Charles, Inc.: *See—*
Long, Lewis Frank, B 751,989, Cl. 324-73.0AT.
Exner, Lawrence J.: *See—*
Rosenthal, Isadore; Exner, Lawrence J.; Niksa, Gregory J.; Weiss, Warren I.; and Young, Maurice G., 4,112,714, Cl. 68-206.000.
Extra, Piet M. J.; Smeets, Lambertus R. J. M.; Van Bavel, Adrianus W. M.; Van Lieshout, Jacobus J.; and Deckers, Albert T., to Oce-van der Grinten N.V. Apparatus for developing electrostatic charge images. 4,112,870, Cl. 118-657.000.
Exxon Research & Engineering Co.: *See—*
Engel, Lawrence J.; and Gardiner, John B., B 493,328, Cl. 252-51.50R.
Gorbaty, Martin L., B 637,443, Cl. 210-40.000.
Gorbaty, Martin L.; Tao, Frank F.; and Maa, Peter S., B 693,830, Cl. 208-8.000.
Kantner, Edward, B 800,786, Cl. 429-50.000.
Lonstrup, Thorkild F.; Brownawell, Darrell W.; Goletz, Edward, Jr.; and Numair, Solomon J., B 741,032, Cl. 252-51.50A.
Palkes, Mark, 4,112,918, Cl. 126-270.000.
Riley, Kenneth L.; and Pine, Lloyd A., B 773,427, Cl. 252-439.000.
Watson, Albert T.; and Hull, Robert L., B 718,846, Cl. 260-897.00A.
Fabriksmontering i Trelleborg AB: *See—*
Anderberg, Nils-Eric, 4,112,958, Cl. 135-5.00A.
Fabrique Nationale Herstal S.A. en abrege FN: *See—*
Bourlet, Maurice V., 4,112,817, Cl. 89-33.00B.
Facchini, Rigo: *See—*
Cole, Lawrence S.; Cole, Ruth J.; and Facchini, Rigo, 4,112,800, Cl. 83-411.00A.
Fahlen, Theodore S.: *See—*
Pressley, Robert J.; and Fahlen, Theodore S., B 773,826, Cl. 331-94.5PE.
Fairchild Camera and Instrument Corporation: *See—*
Kendall, Larry J., B 706,668, Cl. 340-347.0AD.
Falk Corporation, The: *See—*
Phinney, John M., B 759,390, Cl. 192-.098.
Falk, Mervin L.: *See—*
Ganske, Kingston; Hibbard, Earl R.; Falk, Mervin L.; and Denk, Joseph P., B 786,234, Cl. 360-99.000.
Falk, Richard A. Molten metal dip sampler. 4,112,769, Cl. 73-425.40R.
Fallon, John Leslie: *See—*
Colglazier, Donald Francis; Fallon, John Leslie; Kollar, Ernest Paul; and Mares, Fred Ralph, B 788,570, Cl. 271-10.000.
Farley, David L.: *See—*
Evans, Robert T.; and Farley, David L., B 846,232, Cl. 166-264.000.
Farley, James R.: *See—*
Maier, Alfred E.; Armstrong, Donald D.; and Farley, James R., B 829,702, Cl. 200-153.00G.
Farr, Glyn Phillip Reginald, to Girling Limited. Dual hydraulic braking system for vehicles. B 695,467, Cl. 340-626.000.
Farr, Glyn Phillip Reginald, to Girling Limited. Brake pressure reducing control valve. B 782,938, Cl. 303-6.00C.
Fasbender, Heinz: *See—*
Hoppen, Heinz; and Fasbender, Heinz, B 787,598, Cl. 241-24.000.
Faulkenberry, Wayne J.; and Riviere, Henry W., to General Electric Company. Overdrive protection circuit. B 798,655, Cl. 330-207.00P.
Featherstone, Harry Edwin; and Sniff, Walter Grant, Jr., to Orrville Products, Inc. Method of joining two sheet metal parts. B 809,911, Cl. 219-137.00R.
Feder, Alvin, to Motorola, Inc. Multi-position switch with single sliding actuator cam, reciprocable cam follower and compressive conductive elastomer. B 800,245, Cl. 200-16.00R.
Feldman, Charles L.; and Hubelbank, Mark, to Electronics for Medicine, Inc. Apparatus and method for ECG baseline shift detecting. 4,112,930, Cl. 128-2.06R.
Feldmar Products, Inc.: *See—*
Booty, Donald J., B 726,479, Cl. 325-390.000.
Felix, Rolf: *See—*
Fleisch, Herbert A.; and Felix, Rolf, B 792,946, Cl. 424-204.000.
Fleisch, Herbert A.; and Felix, Rolf, B 792,947, Cl. 424-204.000.
Fellows, Ronald John: *See—*
Palfrey, Lesley Francis; and Fellows, Ronald John, 4,112,589, Cl. 34-48.000.
Feltz, Albert J.; and Deck, Howard C., to Singer Company, The. Automatic lower loop restorer mechanism. B 811,913, Cl. 352-159.000.
Fernandez, Maria del Carmen: *See—*
Fernandez, Santiago Julio; and Fernandez, Maria del Carmen, 4,112,595, Cl. 35-35.00E.
Fernandez, Santiago Julio; and Fernandez, Maria del Carmen. Teaching devices. 4,112,595, Cl. 35-35.00E.

Ferrara, Louis Thomas; and Roccisano, Janet. Blood collection valve. 4,112,924, Cl. 128-2.00F.

Ferrarese, Frank L.: *See—*
Bush, Austin R.; and Ferrarese, Frank L., B 773,778, Cl. 206-319.000.

Ferraris, Giuseppe: *See—*
Cesca, Sebastiano; Priola, Aldo; and Ferraris, Giuseppe, B 795,225, Cl. 260-683.15B.

Ferrentino, Antonio; and Brovedan, Antonio, to Industrie Pirelli Societa per Azioni. Apparatus for laying-up together a plurality of fragile filaments. 4,112,660, Cl. 57-59.000.

Ferri, John L.; Mathers, James E.; and Yale, Ramon L., to GTE Sylvania Incorporated. Terbium-activated rare earth oxysulfide phosphors with controlled decay. B 525,589, Cl. 252-301.40S.

Fesquet, Amedee. Machinery for the mass production of pronged members or of continuous strips of pronged members. 4,112,674, Cl. 59-72.000.

Fibre Containers Company: *See—*
Scott, Donald M., B 737,600, Cl. 206-523.000.

Fidler, Gary L.; Hill, Richard A.; and Carrera, John P., to Westinghouse Electric Corp. Valve arrangement for a nuclear plant residual heat removal system. B 686,858, Cl. 176-38.000.

Fiedler, Howard C., to General Electric Company. Method of producing silicon-iron sheet material with copper as a partial substitute for sulfur, and product. B 837,504, Cl. 148-111.000.

Fiege, Helmut; Haydn, Josef; Renner, Johann; and Wedemeyer, Karl-fried, to Bayer Aktiengesellschaft. Process for purifying alkylphenolz. B 757,422, Cl. 568-756.000.

Fields, Ernest E.; and Reineck, Lester W., to Outboard Marine Corporation. Liquid tank cap having a vent. B 823,614, Cl. 220-367.000.

Filianovich, Jevgeny Grigorievich: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.

Filmon Process Corp.: *See—*
Ploeger, Walter, Jr., B 578,581, Cl. 400-240.100.

Filtertek, Inc.: *See—*
Leason, Hayden L., B 798,644, Cl. 210-446.000.

Filzinger, Klaus: *See—*
Fuchs, Hermann; and Filzinger, Klaus, B 765,004, Cl. 260-149.000.

Finike Italiana Marposs Soc. in Accomandita Semplice di Mario Possati & C.: *See—*
Possati, Mario, 4,112,629, Cl. 51-165.930.

Finn, James J., to Diagnostic Isotopes Incorporated. Ampule capable of being autoclaved. B 712,802, Cl. 206-528.000.

Fiorenza, Giorgio, to Ing. C. Olivetti & C., S.p.A. Electronic desk-top accounting machine and calculator. B 722,506, Cl. 235-375.000.

Firmenich & Cie: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., B 825,111, Cl. 426-536.000.

Fischer, Adolf, deceased (by Fischer, Caecilia Emma, heiress-at-law); and Hamprecht, Gerhard, to BASF Aktiengesellschaft. N',N'-disubstituted 2,1,3-benzothiadiazin-(4)-one-2,2-dioxides. B 636,162, Cl. 544-11.000.

Fischer, Caecilia Emma, heiress-at-law: *See—*
Fischer, Adolf, deceased; and Hamprecht, Gerhard, B 636,162, Cl. 544-11.000.

Fischer & Porter Company: *See—*
Hermanns, Henry M., 4,112,960, Cl. 137-85.000.

Fischer, Robert Bowlby: *See—*
Larson, John Arden; and Fischer, Robert Bowlby, B 819,355, Cl. 148-36.000.

Fister, Julius C., Jr.; Breedis, John F.; and Pryor, Michael J., to Swiss Aluminium Ltd. High strength aluminum extrusion alloy. B 784,155, Cl. 75-142.000.

Fitzmayer, Louis H.: *See—*
Simon, Donald J.; and Fitzmayer, Louis H., B 819,789, Cl. 219-10.55D.

Fitzsimmons, William A.; and Lawler, James E., to Fitzsimmons, William A. Device for determining angles. 4,112,580, Cl. 33-174.00S.

Flament, Ivon: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., B 825,111, Cl. 426-536.000.

Flanagan, Joseph E.: *See—*
Grant, Louis R.; and Flanagan, Joseph E., B 732,624, Cl. 260-564.00G.

Flaum, Dennis Michael; and Fleishman, Herman Lawrence. Zipper construction. 4,112,556, Cl. 24-205.10R.

Fleisch, Herbert A.; and Felix, Rolf, to Procter & Gamble Company, The. Phosphonate pharmaceutical composition. B 792,946, Cl. 424-204.000.

Fleisch, Herbert A.; and Felix, Rolf, to Procter & Gamble Company, The. Carboxy phosphonate pharmaceutical composition. B 792,947, Cl. -.24-204.000.

Fleischer, Henry. Clamping device. B 819,819, Cl. 285-45.000.

Fleishman, Herman Lawrence: *See—*
Flaum, Dennis Michael; and Fleishman, Herman Lawrence, 4,112,556, Cl. 24-205.10R.

Fletcher, Samuel G.; and McCutcheon, Martin J. Pseudo palate useful for diagnosis and treatment of speech impairment. 4,112,596, Cl. 35-35.00R.

Flodman, Leif A.: *See—*
Nyren, Jan O.; Nordin, Soren B.; and Flodman, Leif A., B 761,209, Cl. 162-127.000.

Flower, Robert J.; Snedeker, Clarke R.; and Beatenbough, Paul K., to General Motors Corporation. Recuperator. B 789,066, Cl. 165-81.000.

FMC Corporation: *See—*
Gerow, Gordon P., B 399,238, Cl. 203-2.000.

Fohl, Artur, to Repa Feinstanzwerk GmbH. Safety device for arresting unrolling of roller blinds. 4,112,996, Cl. 160-296.000.

Fono, Andrew; and Patton, Ray F., to Royce Chemical Company. Process for dyeing cellulosic textiles with vat and sulfur dyes. B 680,198, Cl. 8-34.000.

Fontanilles, Henry: *See—*
Burns, Donald Arthur; and Fontanilles, Henry, B 749,558, Cl. 356-36.000.

Food Automation-Service Techniques, Inc.: *See—*
Koether, Bernard G.; and Shaughnessy, William J., B 790,429, Cl. 210-167.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. End loaded carton with automatic header. B 842,261, Cl. 206-45.140.

Ford, John Charles, to Girling Limited. Hydraulically operated disc brakes. B 688,914, Cl. 188-72.500.

Ford, Michael Alan. Tunable electrical filter network. B 754,643, Cl. 333-70.0CR.

Ford, Michael Alan; Mould, Henry Manifold; and Kolb, Dieter. Transient suppressor network for spectrophotometers and the like. B 757,204, Cl. 356-96.000.

Forg, Wolfgang, to Linde Aktiengesellschaft. Liquefaction of natural gas. 4,112,700, Cl. 62-28.000.

Forlini, Matthew: *See—*
Saxe, Robert L.; Thompson, Robert I.; and Forlini, Matthew, B 795,819, Cl. 350-362.000.

Forrest, William J. Livestock transport apparatus. 4,112,874, Cl. 119-158.000.

Forward, Cleve H.; and Higgins, Jerry G. Alkyl vinyl copolymer. B 655,205, Cl. 521-60.000.

Foss, Richard W., to Jos. Dyson & Sons, Inc. Lift fork construction. B 776,283, Cl. 214-750.000.

Fox, Richard C.: *See—*
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., B 811,504, Cl. 148-23.000.
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., B 811,505, Cl. 148-23.000.

Fraas, Lewis M.: *See—*
Zanio, Kenneth W.; and Fraas, Lewis M., B 735,560, Cl. 148-174.000.

Frank, Earl E.; and Yee, Bing S., to Abex Corporation. Hydraulic apparatus. B 724,720, Cl. 210-167.000.

Franks, Lawrence A.; Stroup, Steven L.; and Perry, James E., to Burr Oak Tool & Gauge Company. Tube cutter with phase changer. 4,112,794, Cl. 82-64.000.

Franson, David C.: *See—*
Hoffman, Robert K.; and Franson, David C., 4,112,968, Cl. 137-427.000.

Frantz, Virgil L., to Graham-White Sales Corp. Compressed gas filter assembly. B 804,733, Cl. 55-162.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft M.B.H.: *See—*
Theurer, Josef; Praschl, Wilhelm; and Riessberger, Klaus, B 672,276, Cl. 212-28.000.

Fraser, Lawrence J.; and Liebman, Alan, to Xerox Corporation. Color development system. B 758,538, Cl. 355-4.000.

Frazier, Albert A.; and Phillips, Howard W., to Aladdin Industries, Incorporated. Vacuum bottle with air pump to pressurized bottle to effect dispensing. B 837,519, Cl. 222-131.000.

Freisler, Erhard, to Ruti Machinery Works Ltd. Device for feeding pile warp yarns for pile fabric looms. 4,112,981, Cl. 139-102.000.

Freudenschuss, Otto, to Vockenhuber, Karl; and Hauser, Raimund. Method of and system for measuring distances. B 749,333, Cl. 356-5.000.

Frey, Hans-Helmut; and Klug, Helmut, to Hoechst Aktiengesellschaft. Thermoplastic compositions comprising PVC and chlorinated polyethylene. B 849,161, Cl. 260-897.00C.

Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, to Wacker-Chemie GmbH. Preparation of organopolysiloxane polymers. B 808,767, Cl. 260-448.20E.

Friedell, Morley V. Oscillation damping pressure relief valve. 4,112,970, Cl. 137-489.500.

Friedli, Hans R.: *See—*
Strojny, Edwin J.; Friedli, Hans R.; and Wing, Milton S., B 828,409, Cl. 260-346.750.

Frielingsdorf, Hans: *See—*
Schweier, Gunther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, B 762,858, Cl. 526-124.000.

Friese, Axel; and Simon, Stefan, to Dr. Carl Hahn G.m.b.H. Apparatus for transferring a deformable cylindrical work piece from one work station to another. B 731,954, Cl. 198-480.000.

Frink, Russell E.; and Milianowicz, Stanislaw A., to Westinghouse Electric Corp. Quick-acting movable operating-column tripping device. B 468,332, Cl. 200-144.00R.

Frinzel, Jerry C. Intravenous pole. B 801,478, Cl. 248-412.000.

Fritsch, Robert A.; Gattu, Narahari; and Vaerk, Lembit, to Harnischfeger Corporation. Boom section for telescopic crane boom. 4,112,649, Cl. 52-731.000.

Frituz, Bela: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.

Fritzler, Ulrich M., to Fritzler, Ulrich M. Roof reflective polygon scanning apparatus. B 721,892, Cl. 352-105.000.

Fritzsche, Gunther: *See—*
Affeldt, Karl-Heinz; Fritzsche, Gunther; Ganzke, Joachim; and Raupach, Gerhard, 4,112,929, Cl. 128-2.05M.

Fry, James H., Jr. Power circuit identifier which produces a voltage pulse in response to interruption of power. B 818,923, Cl. 324-66.000.

Fry, Michael George Joseph, to Brentford Electric Limited. Magnetic or electric measuring devices. B 733,476, Cl. 324-0.50E.

Frye, James A. Rotary plug valve. B 735,699, Cl. 251-159.000.

Fu, Horng-sen; Holloway, Thomas C.; Tasch, Al F., Jr.; and Chatterjee, Pallab K., to Texas Instruments Incorporated. Fabrication methods for the high capacity ram cell. 4,112,575, Cl. 29-577.00C.

Fuchs, Hermann; and Filzinger, Klaus, to Hoechst Aktiengesellschaft. 1:2-Cobalt-complex azo dyestuffs having an acetoacetylamino diphenylamino coupler. B 765,004, Cl. 260-149.000.

Fudman, Israel. Device for shaving ice. B 814,448, Cl. 241-92.000.

Fuhrman, Gunther Georg; Krogmann, Uwe Jonny; and Schroth, Gerhard Wolfgang. Ash removal equipment arranged on a lifting mechanism for pulverized-coal furnaces of large-capacity steam generators. 4,112,856, Cl. 110-165.00R.

Fuji Photo Film Co., Ltd.: *See—*
Sato, Masamichi, B 694,423, Cl. 96-36.000.
Sato, Masamichi; and Fujii, Itsuo, B 785,886, Cl. 96-67.000.
Shishido, Tadao; Hara, Hiroshi; and Arai, Atsuaki, B 806,121, Cl. 96-100.00R.
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, B 231,001, Cl. 96-60.00R.
Yamada, Minoru; Shishido, Tadao; and Arai, Atsuaki, B 686,201, Cl. 96-56.000.

Fuji Telecasting Co., Ltd.: *See—*
Itoh, Hiroyuki; Mitsuhashi, Kenhachi; and Akashi, Hiromitsu, 4,112,746, Cl. 73-95.000.

Fujii, Itsuo: *See—*
Sato, Masamichi; and Fujii, Itsuo, B 785,886, Cl. 96-67.000.

Fujimoto, Keimei: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, B 768,875, Cl. 424-225.000.

Fujimura, Syunichi: *See—*
Hagiwara, Miyuki; Araki, Kunio; Matsuoka, Shingo; and Fujimura, Syunichi, B 639,066, Cl. 204-159.170.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, B 640,910, Cl. 544-16.000.

Fujita, Masanori; and Suzuki, Sukenori, to Kabushiki Kaisha Seikosha. Electrically conductive adhesive connecting arrays of conductors. B 751,730, Cl. 174-88.00R.

Fujita, Takeshi: *See—*
Mori, Shigeo; and Fujita, Takeshi, B 616,722, Cl. 521-163.000.

Fujita, Tsuguto: *See—*
Harada, Masaaki; and Fujita, Tsuguto, B 816,773, Cl. 355-71.000.

Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, to Mitsubishi Chemical Industries, Ltd.; and Seikagaku Kogyo Co., Ltd. Process for the renewal of an insolubilized glucose isomerase. B 780,843, Cl. 195-68.000.

Fujitsu Limited: *See—*
Nojiri, Shoji; Kanzaki, Hisao; Yasoshima, Nobuyuki; Satake, Yasuo; and Ogawa, Kenichi, B 788,971, Cl. 179-84.00R.
Yamaguchi, Hisashi; Sato, Seii; Iemori, Toshiaki; and Andoh, Shizuo, B 767,690, Cl. 315-169.0TV.

Fujiwa Kika Kabushiki Kaisha: *See—*
Sato, Jiro, 4,112,998, Cl. 164-136.000.

Fujiwara, Katsuji. Spherical valve assembly. B 804,589, Cl. 251-174.000.

Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, to Konishiroku Photo Industry Co., Ltd. Method for processing light-sensitive silver halide photographic materials. B 814,121, Cl. 96-60.00R.

Fukuda, Kazumasa: *See—*
Tokuoka, Yasumichi; and Fukuda, Kazumasa, B 744,115, Cl. 148-105.000.

Fukuda, Mataharu, to Nippon Cable Systems Inc. Flexible drive cable. 4,112,708, Cl. 64-2.00R.

Fukunaka, Shiro: *See—*
Uchida, Kuniki; Araki, Kenzi; Narita, Hirosi; Fukunaka, Shiro; and Kurihara, Takao, B 776,288, Cl. 148-12.300.

Fukushima, Keitaro; Kusunose, Takamaro; and Nosaka, Yoshinori, to Japan Exlan Company Limited. Process for producing carbon fibers. B 719,504, Cl. 423-447.400.

Fukuta, Shigemi; Izaki, Hiroshi; and Yoshino, Shoichi, to Kubota, Ltd. Chill preventing arrangement for use in centrifugal casting and method for preventing chill thereby. B 712,068, Cl. 164-286.000.

Funakoshi, Satoshi, to Green Cross Corporation, The. HBsAG Particle composed of single polypeptide subunits and the preparation procedure. B 664,983, Cl. 260-112.00R.

Funakoshi, Satoshi; and Oomura, Takao, to Green Cross Corporation, The. Haptoglobin insolubilized by being fixed in fibrin. B 813,419, Cl. 424-78.000.

Fundom, Danny L.: *See—*
Dietz, Raymond A. F.; Fundom, Danny L.; Henning, George J.; and McKinney, Lynn B., B 744,965, Cl. 206-508.000.

Funk, Clarence J., to United States of America, Navy. Acoustic device. B 589,658, Cl. 340-2.000.

Furia, Arnold. Folding attachment for bicycles. B 774,526, Cl. 280-287.000.

Furia, Thomas Edward: *See—*
Bellanca, Nicolo; and Furia, Thomas Edward, B 799,795, Cl. 106-137.000.

Furugard, Erik: *See—*
Brosow, Jorgen; and Furugard, Erik, B 647,935, Cl. 235-493.000.

Furukawa, Akio, to Ricoh Company, Ltd. Flash mechanism for camera. B 796,072, Cl. 354-149.000.

Furukawa Electric Company Limited, The: *See—*
Hagiwara, Miyuki; Araki, Kunio; Matsuoka, Shingo; and Fujimura, Syunichi, B 639,066, Cl. 204-159.170.

Furuya, Nobuo: *See—*
Itoh, Tsutomu; Furuya, Nobuo; and Ohuchi, Kenji, 4,112,869, Cl. 118-623.000.

Fuse, Takeshi; Yajima, Toshio; Hino, Isao; and Oka, Shohei, to Osaka Prefectural Office. Apparatus for hanging a board. B 761,278, Cl. 248-204.000.

G. D. Searle & Co.: *See—*
Schlatter, James M.; and Goodmonson, Owen, B 807,083, Cl. 260-112.50R.

G. Duesterloh GmbH: *See—*
Klie, Jurgen, 4,112,973, Cl. 137-625.210.

Gabler, Josef: *See—*
Chrtek, Milan; Gabler, Josef; Tuma, Frantisek; Kasparek, Karel; and Blasko, Jan, 4,112,663, Cl. 57-58.890.

Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, to Rohm GmbH. Method of making carbonic acid esters. B 827,771, Cl. 260-463.000.

Gaertner, Waldemar, to Siemens Aktiengesellschaft. Arrangement for directional radiation of light in symbol-indicator systems. B 782,187, Cl. 350-96.240.

Gaessler, Henri Pierre: *See—*
Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, B 605,926, Cl. 204-180.00R.

GAF Corporation: *See—*
Tracy, David J.; and Hoffstadt, Walter F., B 742,058, Cl. 548-365.000.

Gai-Tronics Corporation: *See—*
Day, Paul B., B 756,238, Cl. 179-2.00R.

Gale, Preston L.: *See—*
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., B 733,562, Cl. 428-565.000.

Gallagher Electronics Limited: *See—*
Gallagher, William Murray, B 757,288, Cl. 361-232.000.

Gallagher, William Murray, to Gallagher Electronics Limited. Electric fence controllers. B 757,288, Cl. 361-232.000.

Gambro AG: *See—*
Riede, Gerhard, B 802,363, Cl. 210-321.00B.

Games Research Associates: *See—*
Sain, Paul E., B 769,557, Cl. 273-245.000.

Gansfried, Myles Stephen, to U.S. Philips Corporation. Cable-supporting arrangement for X-ray tomographic scanner. B 799,089, Cl. 250-445.00T.

Ganske, Kingston; Hibbard, Earl R.; Falk, Mervin L.; and Denk, Joseph P., to Insurance Technology Company. Recording system with gas supported record medium. B 786,234, Cl. 360-99.000.

Ganzke, Joachim: *See—*
Affeldt, Karl-Heinz; Fritzsche, Gunther; Ganzke, Joachim; and Raupach, Gerhard, 4,112,929, Cl. 128-2.05M.

Gardiner, John B.: *See—*
Engel, Lawrence J.; and Gardiner, John B., B 493,328, Cl. 252-51.50R.

Gardner, Derek Victor, to Beecham Group Limited. Tetrahydroisoquinoline basic ethers and pharmaceutical compositions and methods employing them. B 710,446, Cl. 424-258.000.

Gardziella, Arno; and Jellinek, Karl, to Rutgerswerke Aktiengesellschaft. Method of applying powder coatings of unsaturated branched hydroxyester resins. B 650,649, Cl. 427-195.000.

Garehime, Jacob W., Jr. Surveillance and weapon system. 4,112,818, Cl. 89-41.0TV.

Garin, John; and Belsick, James C., to United States of America, Energy. Core disruptive accident margin seal. B 714,220, Cl. 176-87.000.

Garin, Torunn Atteraas: *See—*
Kramer, Franklin; Henig, Yair Steve; Garin, Torunn Atteraas; and Vogel, Gerald James, B 771,485, Cl. 426-422.000.

Garsky, Victor M.; and McGregor, William H., to American Home Products Corporation. [Des-Ala^1, Gly^2-desamino-Cys^3]somatostatin. B 538,628, Cl. 260-112.50S.

Gartner, Klaus W.: *See—*
Uyeda, Tim M., 4,112,715, Cl. 70-38.00A.

Gas Developments Corporation: *See—*
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., B 738,481, Cl. 165-3.000.

Gasper, Stephen A., to Roberts Corporation. Conveyor control system. 4,112,999, Cl. 164-154.000.

Gates, John William Charles; Hall, Roy Geoffrey Noel; Ross, Ian Norman; and Stevens, Richard Frederick, to National Research Development Corporation. Optical apparatus for determining relative positioning of two members. B 700,037, Cl. 356-110.000.
Gates, Michael. Multiple implement folding hitch. B 813,517, Cl. 280-413.000.
Gattu, Narahari: *See—*
Fritsch, Robert A.; Gattu, Narahari; and Vaerk, Lembit, 4,112,649, Cl. 52-731.000.
Gaudiani, Vincent A.: *See—*
Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., 4,112,952, Cl. 128-418.000.
Gauron, Richard F.; and Laconte, Susana S., to Marketing Masters. Latch. B 814,330, Cl. 292-165.000.
Gautschi, Fritz: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., B 825,111, Cl. 426-536.000.
Gauvry, Robert; and Portalier, Robert, to Societe de Vente de l'Aluminium Pechiney. Process for obtaining novel blanks for extrusion by impact. B 778,233, Cl. 75-148.000.
Gay, Guy R.; and Gay, Neil. Mail box support. B 776,123, Cl. 248-128.000.
Gay, Neil: *See—*
Gay, Guy R.; and Gay, Neil, B 776,123, Cl. 248-128.000.
GD Anker Gebirgs-Dubel-Anker GmbH & Co. KG: *See—*
Gruber, Rudolf, 4,112,694, Cl. 405-150.000.
Gebauer, Herbert: *See—*
Kubens, Rolf; and Gebauer, Herbert, B 796,935, Cl. 166-295.000.
Gehringer, Ronald F.: *See—*
Conger, William H.; and Gehringer, Ronald F., 4,112,820, Cl. 70-363.000.
Geis, David G.; and Hodne, Ingard B., to Teletype Corporation. System for mounting an armature. B 816,823, Cl. 335-270.000.
Gemp, Robert S.: *See—*
Hull, Robert E.; and Gemp, Robert S., B 816,556, Cl. 307-53.000.
General Battery Corporation: *See—*
Nees, John; and Pike, Kenneth, B 734,311, Cl. 75-166.00C.
Nees, John; and Pike, Kenneth, B 768,960, Cl. 75-166.00C.
General Binding Corporation: *See—*
Giulie, Joe D., 4,112,603, Cl. 40-2.00R.
General Electric: *See—*
Lee, Gim Fun, Jr., B 527,142, Cl. 260-876.00B.
General Electric Company: *See—*
Bochan, John, 4,112,767, Cl. 74-217.00R.
Faulkenberry, Wayne J.; and Riviere, Henry W., B 793,655, Cl. 330-207.00P.
Fiedler, Howard C., B 837,504, Cl. 148-111.000.
Horvay, Julius B., B 749,164, Cl. 312-214.000.
Lee, Gim Fun, Jr., B 671,569, Cl. 260-876.00B.
Mark, Victor, B 733,015, Cl. 260-45.80N.
Mark, Victor; and Hedges, Charles Vernon, B 755,981, Cl. 568-750.000.
Simon, Donald J.; and Fitzmayer, Louis H., B 819,789, Cl. 219-10.55D.
Wambach, Allen Dale, B 747,635, Cl. 260-40.00R.
General Foods Corporation: *See—*
Henig, Yair Steve; and Purohit, Kailash S., B 771,486, Cl. 426-422.000.
Katz, Saul Norman, B 837,349, Cl. 426-422.000.
Kramer, Franklin; Henig, Yair Steve; Garin, Torunn Atteraas; and Vogel, Gerald James, B 771,485, Cl. 426-422.000.
General Kinetics, Incorporated: *See—*
King, Charles A.; and Gutterman, Robert P., B 716,285, Cl. 209-609.000.
General Motors Corporation: *See—*
Carol, John A., Jr.; and McAlindon, Harold P., B 845,959, Cl. 235-96.000.
Cataldo, Roy S., 4,112,826, Cl. 92-13.100.
Flower, Robert J.; Snedeker, Clarke R.; and Beatenbough, Paul K., B 789,066, Cl. 165-81.000.
Gilbert, William F.; and Lucas, Larry D., B 741,805, Cl. 179-1.0GQ.
Kapanka, Harley L., B 862,954, Cl. 297-408.000.
Kibler, Roland G., 4,112,886, Cl. 123-103.00R.
Kirsch, Norbert, B 776,202, Cl. 293-96.000.
Lusa, George; and Mathues, Thomas P., B 836,140, Cl. 188-364.000.
Mann, Gamdur S., 4,112,577, Cl. 29-611.000.
Smith, Stanley E., B 829,279, Cl. 403-138.000.
Spaulding, James R., 4,112,891, Cl. 123-117.00A.
Sutton, Stephen J.; Holen, J. Robert; and Creager, John E., B 854,711, Cl. 338-33.000.
Walker, Frank H., B 798,768, Cl. 192-3.310.
Genovese, David L.: *See—*
Baio, Alfred R.; and Genovese, David L., B 800,732, Cl. 235-458.000.
Georg Fischer Aktiengesellschaft: *See—*
Hofmann, Franz; and Szatmari, Franz, B 729,979, Cl. 366-56.000.
George Koch Sons, Inc.: *See—*
Koch, Robert L., II, B 731,755, Cl. 427-44.000.
Gera, Lajos: *See—*
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, B 728,459, Cl. 424-251.000.
Gerber Garment Technology, Inc.: *See—*
Pearl, David R., 4,112,797, Cl. 83-177.000.
Gerndt, Christian, to Siemens Aktiengesellschaft. Branching arrangement for communication transmission links having optical glass fibers. B 635,366, Cl. 350-96.150.
Gerow, Gordon P., to FMC Corporation. Method of and apparatus for steam stripping immiscible materials. B 399,238, Cl. 203-2.000.
Gettert, Hans; Jeck, Arnulf; and Werner, Dietmar, to Texaco Development Corporation. Process for the partial oxidation of liquid hydrocarbonaceous fuels. B 861,744, Cl. 48-197.00R.
Geus, John W., to Stamicarbon, N.V. Process for homogeneous deposition precipitation of metal compounds on support or carrier materials. B 663,106, Cl. 252-454.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Grisebach, Hans Theodor, 4,112,680, Cl. 60-538.000.
Temme, Helmut, B 769,094, Cl. 198-731.000.
Ghetti, Giuseppe: *See—*
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, B 775,776, Cl. 260-875.000.
Gibbons, Paul J. Penetrating oil composition. B 750,735, Cl. 252-11.000.
Gibbs, David James. Exercising apparatus. B 693,965, Cl. 272-69.000.
Gibby, Mabel K. Needle. B 818,055, Cl. 223-102.000.
Gilbert, Henry L.; and Van Ordstrand, Cayrl W., to Martin Marietta Aluminum Inc. Armor-piercing incendiary projectile. 4,112,846, Cl. 102-52.000.
Gilbert, William F.; and Lucas, Larry D., to General Motors Corporation. Voltage translating circuit for volume and balance control of a four-channel audio system. B 741,805, Cl. 179-1.0GQ.
Giles, Dion Ewing: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, B 686,496, Cl. 423-512.00A.
Gillery, F. Howard, to PPG Industries, Inc. Sputtering technique for the deposition of indium oxide. B 836,269, Cl. 204-192.00P.
Gilomen, Beat, to A. Schild S.A. Operating mechanism for mechanical watch movement. 4,112,673, Cl. 58-85.500.
Ginefra, Anthony, Sr. Clock display device. 4,112,672, Cl. 58-53.000.
Girling Limited: *See—*
Farr, Glyn Phillip Reginald, B 695,467, Cl. 340-626.000.
Farr, Glyn Phillip Reginald, B 782,938, Cl. 303-6.00C.
Ford, John Charles, B 688,914, Cl. 188-72.500.
Harries, David Anthony, 4,112,682, Cl. 60-548.000.
Giubilo, Lauro B. Temporary stopper for outlets of toilet bowls. 4,112,527, Cl. 4-295.000.
Giulie, Joe D., to Minnesota Mining and Manufacturing Company. Removable binding device. B 625,131, Cl. 402-46.000.
Giulie, Joe D., to General Binding Corporation. Luggage tag. 4,112,603, Cl. 40-2.00R.
Givaudan Corporation: *See—*
Schenk, Hanspeter, B 729,521, Cl. 252-522.000.
Glaesel, Gottfried, to Hego Electric GmbH. Means for mounting on channel-section supporting rails. B 680,411, Cl. 174-158.00R.
Glaudel, Stephen P.; and Chambers, Norman T., to Westinghouse Electric Corp. Turbine-generator protection system with electronic sampling filter. B 735,718, Cl. 322-38.000.
Glaxo Laboratories Limited: *See—*
Laundon, Brian; Cowley, Brian Richard; and Humber, David Cedric, B 749,300, Cl. 204-158.0HA.
Glazar, Arthur J., to Servo Corporation of America. Hot box detector bearing discriminator circuit. B 841,700, Cl. 246-169.00A.
Gleockler, Frederick M.; and Gleockler, Robert G. Tree ladder. B 791,465, Cl. 182-63.000.
Gleockler, Robert G.: *See—*
Gleockler, Frederick M.; and Gleockler, Robert G., B 791,465, Cl. 182-63.000.
Glover, Ernest. Film projection system. B 755,132, Cl. 352-8.000.
Glueck, Robert D. Lift for dragged implement. B 787,751, Cl. 172-178.000.
Glumac, Nick P., to Toter-Tee, Inc. Loading arrangement. B 708,400, Cl. 214-10.50R.
Glushkov, Alexandr Ivanovich; Krutov, Sergei Vasilievich; Semenov, Vladimir Ivanovich; and Gusev, Anatoly Fedorovich. Automatically adjustable cutting apparatus for purposes such as filleting fish. 4,112,547, Cl. 17-57.000.
Godwin, Robert H.; and Collignon, Herbert E., to Bliss & Laughlin Industries Incorporated. Adjustable gas cylinder chair control. B 764,371, Cl. 248-400.000.
Gohm, William G., to Westinghouse Electric Corp. Magnetic pipe cleaner. B 742,474, Cl. 209-215.000.
Goldfarb, Adolph E.; Benkoe, Erwin; and Robinson, Don, to Goldfarb, Adolph E.; and Benkoe, Erwin. Toy game for moving an object up an inclined surface. B 770,186, Cl. 273-108.000.
Goldman, Irving M.: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., B 825,111, Cl. 426-536.000.
Goldsborough, Robert R.; Spencer, David R.; and West, Samuel F., to United States of America, Army. Frequency shift rate detector. B 176,890, Cl. 343-112.00S.
Goldstein, Jonathan R.; and Klein, Yitzhak. Secondary cells. B 812,672, Cl. 429-27.000.
Golembeck, Gerald A.; and Horwitz, Thomas L., to United States Bedding Company, The. Foundation unit for bedding. 4,112,529, Cl. 5-354.000.
Goletz, Edward, Jr.: *See—*
Lonstrup, Thorkild F.; Brownawell, Darrell W.; Goletz, Edward, Jr.; and Numair, Solomon J., B 741,032, Cl. 252-51.50A.

Golf Resources, Ltd.: *See*—
Beery, Peter W., B 803,976, Cl. 273-78.000.

Gollel, Richard M. Coin operated ultrasonic cleaning device. 4,112,955, Cl. 134-57.00R.

Gomi, Teruo; Hisa, Yuji; and Soeda, Takahiko, to Ajinomoto Co., Inc. Process for preparing improved soy protein materials. B 790,440, Cl. 260-123.500.

Gondos, Gyorgy: *See*—
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, B 728,459, Cl. 424-251.000.

Goodmonson, Owen: *See*—
Schlatter, James M.; and Goodmonson, Owen, B 807,083, Cl. 260-112.50R.

Goodyear Aerospace Corporation: *See*—
Haney, James Richard, B 806,796, Cl. 303-115.000.

Goodyear Tire & Rubber Company, The: *See*—
Brown, Jack E., Jr., 4,112,630, Cl. 51-281.00R.

Goransson, Lars Roland; van Oorschot, Gosewinus Franciscus; and Pittoors, Jan Gustaaf, to Atlas Copco Aktiebolag. Method and device relating to separation of liquid from liquid-containing compressed gas. B 750,835, Cl. 55-97.000.

Gorbaty, Martin L., to Exxon Research & Engineering Co. Method for obtaining substantially complete removal of phenols from waste water. B 637,443, Cl. 210-40.000.

Gorbaty, Martin L.; Tao, Frank F.; and Maa, Peter S., to Exxon Research & Engineering Co. Integrated process for the production of hydrocarbons from coal or the like in which fines from gasifier are coked with heavy hydrocarbon oil. B 693,830, Cl. 208-8.000.

Gordon, Ronald S.: *See*—
Virkar, Anil V.; Miller, Mark L.; Cutler, Ivan B.; and Gordon, Ronald S., B 788,572, Cl. 429-193.000.

Gorham, Michael L.; Heckman, Raymond F.; and Yole, Charles S., to Xerox Corporation. Automatic dialer for facsimile terminals and the like. B 793,453, Cl. 179-90.00B.

Gorham, Michael L.; and Norian, Roger F., to Xerox Corporation. Automatic dialer having a selective retry capability. B 793,454, Cl. 179-90.00B.

Goryachev, Vladimir Ilich; Kotelnikov, Grigory Vladimirovich; and Makurin, Pavel Semenovich. Differential scanning microcalorimeter. 4,112,734, Cl. 73-15.00B.

Gosselin, Yvon. Hydraulic log splitter implement. 4,112,985, Cl. 144-193.00A.

Goto, Kenji; and Niwa, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine. 4,112,877, Cl. 123-32.0ST.

Goto, Yorinobu: *See*—
Koike, Sakae; Matsunami, Shoichi; Goto, Yorinobu; and Tanabe, Yoshio, B 755,936, Cl. 423-235.000.

Gouldson, Eric John: *See*—
Pound, Thomas Charles; and Gouldson, Eric John, B 672,366, Cl. 156-56.000.

Graef, Harry T.; Richardson, Jack M.; and Wolfarth, Robert P., to Diebold Incorporated. Sealed tamper-indicating money dispensing containers for automatic banking systems. B 761,288, Cl. 221-6.000.

Grafe, Robert Joseph: *See*—
Boyd, William Weller; Grafe, Robert Joseph; and Pingry, Carl Oscar, III, B 762,376, Cl. 340-147.00R.

Graham-White Sales Corp.: *See*—
Frantz, Virgil L., B 804,733, Cl. 55-162.000.

Gram, Donald J., to University of California, The Regents of the. Method for resolving amino and ammonium compounds. B 806,054, Cl. 560-38.000.

Gramling, William Dwight. Casing stop for well tools and an insertion device therefore. B 788,781, Cl. 166-213.000.

Granges Essem Aktiebolag: *See*—
Beland, Stig Gosta Bele, B 765,282, Cl. 185-10.000.

Grant, John: *See*—
Syred, Nicholas; Grant, John; and Sidhu, Baldip Singh, 4,112,977, Cl. 137-812.000.

Grant, Louis R.; and Flanagan, Joseph E., to Rockwell International Corporation. Triaminoguanidinium salt of tetranitroethane. B 732,624, Cl. 260-564.00G.

Gray, George William: *See*—
Coates, David; Gray, George William; and McDonnell, Damien Gerard, B 821,146, Cl. 252-299.000.

Green Cross Corporation, The: *See*—
Funakoshi, Satoshi, B 664,983, Cl. 260-112.00R.
Funakoshi, Satoshi; and Oomura, Takao, B 813,419, Cl. 424-78.000.

Green, Glen R.: *See*—
Covington, Wayne L.; and Green, Glen R., 4,112,545, Cl. 17-45.000.

Green, Leonard O. Bicycle lock assembly. 4,112,720, Cl. 70-233.000.

Green, Russell W. Method of and means for mounting labels. B 717,232, Cl. 156-247.000.

Greene, Donald: *See*—
McGarry, Francis J.; Greene, Donald; and Otto, Jeffrey B., B 847,571, Cl. 162-123.000.

Greenfield, Frederick Dale. Porthole arrangement. 4,112,645, Cl. 52-304.000.

Greenwald, Richard B.: *See*—
Evans, David H.; and Greenwald, Richard B., B 784,669, Cl. 260-327.00M.

Greenwood, Quentin E. Explosion simulating device. B 784,716, Cl. 320-1.000.

Gregg Engineering Corp.: *See*—
Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Joseph M., B 822,423, Cl. 270-21.000.

Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Joseph M., to Gregg Engineering Corp. Combination web tucker and knife with web grippers and anvil. B 822,423, Cl. 270-21.000.

Gregoire, Joseph M.: *See*—
Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Joseph M., B 822,423, Cl. 270-21.000.

Greiser, John W., to Transco Products, Inc. Broadband spiral antenna. B 751,712, Cl. 343-895.000.

Grenfell, Hugh W.; Bowen, David J.; and Baker, Robert, to British Steel Corporation. Refining molten metal. B 792,602, Cl. 75-60.000.

Grenier, Aime J., to Texas Instruments Incorporated. Circuit breaker. B 755,516, Cl. 335-42.000.

Grenier, Aime J., to Texas Instruments Incorporated. Circuit breaker. B 755,763, Cl. 335-8.000.

Greubel, Waldemar: *See*—
Baur, Guenter; and Greubel, Waldemar, B 782,186, Cl. 350-285.000.

Greven, Johann; and Mostert, Johann, to Schumag Schumacher Metallwerke Gesellschaft mit beschrankter Haftung. Carriage drawing machine for uniformly drawing elongated material to be drawn. 4,112,730, Cl. 72-290.000.

Griesshammer, Rudolf: *See*—
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, B 737,249, Cl. 148-174.000.

Griffin, David: *See*—
Shephard, Margaret Claire; Sugavanam, Balsubramanyan; Worthington, Paul Anthony; Collins, David John; and Griffin, David, B 750,017, Cl. 71-92.000.

Griffin, William. Muzzle loading device. 4,112,606, Cl. 42-90.000.

Grisebach, Hans Theodor, to Gewerkschaft Eisenhutte Westfalia. Control systems and arrangements for mineral mining installations. 4,112,680, Cl. 60-538.000.

Grode, Gerald Arthur; Boggs, Daniel Roy; and Wright, James Irvin, to Baxter Travenol Laboratories, Inc. Flexible collapsible blood freezing containers. 4,112,989, Cl. 150-1.000.

Gross, Harry Robert. Method of making a switch. 4,112,576, Cl. 29-602.00R.

Grossmann, Peter. Method and apparatus for automatically making frames. B 677,541, Cl. 156-218.000.

Grot, Walther Gustav: *See*—
Resnick, Paul Raphael; and Grot, Walther Gustav, B 835,804, Cl. 204-98.000.

Grover, Martin M.: *See*—
Pastor, Stephen D.; and Grover, Martin M., B 808,101, Cl. 260-834.000.

Gruber, Rudolf, to GD Anker Gebirgs-Dubel-Anker GmbH & Co. KG. Tunnel-lagging element and system. 4,112,694, Cl. 405-150.000.

Gruber, Wolfgang: *See*—
Schweier, Gunther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, B 762,858, Cl. 526-124.000.

Gruffaz, Max: *See*—
Balme, Maurice; and Gruffaz, Max, B 297,738, Cl. 260-326.260.

Grunbaum, Heinrich. Arrangement for measuring a radial force applied to a bearing. 4,112,751, Cl. 75-141.00A.

Grundig E.M.V.: *See*—
Zeh, Werner; and Kuhnlein, Dieter, B 802,714, Cl. 360-92.000.

Grundmann, Peter: *See*—
Hein, Wolfgang; Grundmann, Peter; and Cosack, Claus, B 783,714, Cl. 222-396.000.

Gruppo Lepetit S.p.A.: *See*—
Cavalleri, Bruno; and Volpe, Giancarlo, B 759,697, Cl. 548-339.000.
Winters, Giorgio; and DiMola, Nunzio, B 713,011, Cl. 260-288.0CF.

Grzina, Anthony, to Warman International Limited. High pressure internally lined pump casing. B 691,436, Cl. 415-170.00R.

GTE Sylvania Incorporated: *See*—
Armstrong, Donald E.; Shaffer, John W.; Marecek, Paul M.; and Audesse, Emery G., B 724,792, Cl. 431-95.00A.
Bonazoli, Robert P.; and Morgan, William H., Jr., B 812,916, Cl. 431-93.000.
Ferri, John L.; Mathers, James E.; and Yale, Ramon L., B 525,589, Cl. 252-301.40S.
Pressley, Robert J.; and Fahlen, Theodore S., B 773,826, Cl. 331-94.5PE.

Gudat, Wolfgang: *See*—
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, B 809,886, Cl. 303-105.000.

Gudenau, H. W.; Konig, Horst; Rath, Gero; and Roth, Haye, to Demag, A.G. Continuous smelting method. B 771,748, Cl. 75-12.000.

Guenin, Andre, to La Nationale S.A. Smoker's lighter. B 704,794, Cl. 431-124.000.

Guglia, Gaston; and Lupien, Jacques. Capped fuel tank funnel. 4,112,984, Cl. 141-98.000.

Guibert, Raul. Hot air oven for food-loaded cartridges. 4,112,916, Cl. 126-261.000.

Guimarin, Henry L. Adjustable ratchet wrench. 4,112,792, Cl. 81-63.000.

Gulf Research & Development Co.: *See*—
Bunting, Pamela M.; and Deffner, John F., B 751,256, Cl. 44-72.000.

Gusev, Anatoly Fedorovich: *See—*
Glushkov, Alexandr Ivanovich; Krutov, Sergei Vasilievich; Semenov, Vladimir Ivanovich; and Gusev, Anatoly Fedorovich, 4,112,547, Cl. 17-57.000.

Gustafson, Paul R., to United States of America, Navy. Air revitalization compositions. B 790,623, Cl. 252-184.000.

Guth, Ted D.: *See—*
Schrauzer, Gerhard N.; and Guth, Ted D., B 812,478, Cl. 204-157.10R.

Gutterman, Robert P.: *See—*
King, Charles A.; and Gutterman, Robert P., B 716,285, Cl. 209-609.000.

Gysegem, Albert Peter: *See—*
Law, Gabriel H.; and Gysegem, Albert Peter, B 765,223, Cl. 260-37.0SB.

Haage, Karl; and Scharff, Dieter, to Dynamit Nobel Aktiengesellschaft. Fabric-reinforced sealing sheets. B 609,944, Cl. 428-111.000.

Haarhoff, Pierre Cloete; and Schumann, Werner Adolf, to Atomic Energy Board. Method and means for treating a fluid. B 819,016, Cl. 55-17.000.

Habert, Roger, to Ducellier et Cie. Electronic distribution and control device for the ignition of internal combustion engines, particularly for motor vehicles. 4,112,895, Cl. 123-117.00R.

Hachiga, Takasi: *See—*
Uno, Eiichi; and Hachiga, Takasi, 4,112,904, Cl. 123-148.00E.

Hackbarth, Eugene R.; and Van Rens, Russell J., to Outboard Marine Corporation. Carburetor having an automatic choke. B 780,590, Cl. 261-52.000.

Haessly, Walter F.: *See—*
Toma, Charles A.; and Haessly, Walter F., B 678,153, Cl. 219-97.000.

Hafner, Hans Wilhelm; and Pfister, Frieder, to Pfister Waagen GmbH. Apparatus for measuring several force components. 4,112,752, Cl. 73-147.000.

Hagen, Magnus F. Structural-reinforcement means for precision, telescoping, linear slide mechanisms. 4,112,539, Cl. 16-88.000.

Hager, Robert Bonner; Toukan, Sameeh Said; and Walter, Gerald Joseph, to Pennwalt Corporation. Fluorine and sulfur-containing compositions. B 459,132, Cl. 260-348.430.

Hagihira, Tadatoshi: *See—*
Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, B 626,098, Cl. 325-320.000.

Hagiwara, Miyuki; Araki, Kunio; Matsuoka, Shingo; and Fujimura, Syunichi, to Japan Atomic Energy Research Institute; and Furukawa Electric Company Limited, The. Process for producing molded product composed of crosslinked resin or crosslinked-resin coated material on a substrate by means of electron beam. B 639,066, Cl. 204-159.170.

Hagner, Clifford K.; and Wissel, Richard B., to Procter & Gamble Company, The. Article for conditioning fabrics. B 781,385, Cl. 252-8.600.

Hahn, Ernest A., to PPG Industries, Inc. Radiation cure of coating compositions containing diacrylate monomer and hiding pigment. B 778,210, Cl. 427-44.000.

Haines, Ernest Martin, to Telephone Cables Limited. Optical fibre waveguides. B 664,706, Cl. 350-96.290.

Hakki, Moustafa I.: *See—*
Costales, Manuel; and Hakki, Moustafa I., 4,112,666, Cl. 57-105.000.

Halcon International, Inc.: *See—*
Johnson, Richard A., B 740,147, Cl. 260-429.00R.

Hale, Robert L., to United States of America, Energy. Method of fabricating a flow device. 4,112,568, Cl. 29-157.00C.

Hall, Charles M.; and Wright, John B., to Upjohn Company, The. 2'-Hydroxy-3'-carboxy-5'-nitrooxanilate compounds, compositions, and methods of use. B 742,438, Cl. 424-309.000.

Hall, George A., III: *See—*
Meyer, Robert W.; and Hall, George A., III, B 771,458, Cl. 165-154.000.

Hall, Roy Geoffrey Noel: *See—*
Gates, John William Charles; Hall, Roy Geoffrey Noel; Ross, Ian Norman; and Stevens, Richard Frederick, B 700,037, Cl. 356-110.000.

Hall, Stanley Darwin: *See—*
Berry, Lawrence James; and Hall, Stanley Darwin, B 796,279, Cl. 221-1.000.

Halle, Edward: *See—*
Snyder, John M., 4,112,542, Cl. 16-114.00R.

Halliburton Company: *See—*
Barrington, Burchus Q.; and Williamson, Jim R., B 811,506, Cl. 166-334.000.
Evans, Robert T.; and Farley, David L., B 846,232, Cl. 166-264.000.

Hallman, Robert W., to Energy Conversion Devices, Inc. Structure for producing imaged structures. B 205,861, Cl. 96-75.000.

Halpine, Joseph Charles. Seal ring for ball valves. B 819,356, Cl. 251-317.000.

Halse, Per Weien, to Moore Business Forms, Inc. Continuous business forms assembly. B 821,223, Cl. 282-11.50A.

Hamaker, Raymond Weaver: *See—*
Ayers, Robert Lee; and Hamaker, Raymond Weaver, B 736,646, Cl. 148-1.500.

Hamilton, C. Howard; and Ascani, Leonard A., to Rockwell International Corporation. Method of making a metallic structure by combined superplastic forming and forging. B 736,671, Cl. 148-11.50R.

Hamilton, Terence: *See—*
Phillips, Reginald Andrew; Hamilton, Terence; and Thompson, Arthur David, B 734,637, Cl. 299-31.000.

Hammann, Ingeborg: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Homeyer, Bernhard; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, B 645,128, Cl. 424-200.000.
Siegle, Peter; Kuhle, Engelbert; Hammann, Ingeborg; Homeyer, Bernhard; and Behrenz, Wolfgang, B 592,860, Cl. 424-278.000.

Hamprecht, Gerhard: *See—*
Fischer, Adolf, deceased; and Hamprecht, Gerhard, B 636,162, Cl. 544-11.000.

Hampton, Edward L., to Leggett & Platt, Incorporated. Recliner leg rest linkage assembly. B 803,955, Cl. 297-69.000.

Hamsher, James J.; and Lozanov, Merrill, to Pfizer Inc. Process for preparing 6-aminopenicillanic acid. B 745,212, Cl. 195-36.00P.

Haney, James Richard, to Goodyear Aerospace Corporation. Anti-skid power valve. B 806,796, Cl. 303-115.000.

Hanke, Georg: *See—*
Muller, Hans; and Hanke, Georg, B 746,101, Cl. 188-282.000.

Hanning, Dick M. Gas operated reciprocating cleaning agitator. 4,112,937, Cl. 134-141.000.

Hansen, Wray C., Sr. Knob spring. B 773,523, Cl. 403-329.000.

Hanson, Paul D., Sr., to Technical Plastics Corporation. Skirt mounting device for mobile homes. 4,112,638, Cl. 52-169.120.

Hanway, John E., Jr.; and Mumford, Richard G., to Beamer/Wilkinson & Associates. Process for the removal of sulfur dioxide from exhaust flue gases. B 507,290, Cl. 423-242.000.

Hara, Hikoharu: *See—*
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, B 231,001, Cl. 96-60.00R.

Hara, Hiroshi: *See—*
Shishido, Tadao; Hara, Hiroshi; and Arai, Atsuaki, B 806,121, Cl. 96-100.00R.

Hara, Takashi: *See—*
Shimizu, Junichi; Hara, Takashi; Iwakura, Tatsuya; and Itaya, Yoshiro, B 717,322, Cl. 426-602.000.

Hara, Tsutomu: *See—*
Yoshizawa, Isamu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,112,798, Cl. 83-344.000.

Harada, Masaaki; and Fujita, Tsuguto, to Rank Xerox, Ltd. Illumination apparatus for electronic copying machines. B 816,773, Cl. 355-71.000.

Harada, Seiki: *See—*
Saiki, Atsushi; Okubo, Toshio; and Harada, Seiki, B 695,040, Cl. 156-656.000.

Harada, Shigenori: *See—*
Okuda, Hiroji; and Harada, Shigenori, 4,112,710, Cl. 64-23.000.

Harada, Toshiro: *See—*
Akado, Hajime; Uchida, Yoshiro; Yamaguchi, Akihide; Nonoyama, Takao; Ootsubo, Suminobu; and Harada, Toshiro, 4,112,896, Cl. 123-122.00D.

Hardies, Donald E.; and Rinehart, Jay K., to PPG Industries, Inc. Control of pathogenic fungi with fluorinated carbonates. B 784,874, Cl. 424-301.000.

Harigaya, Shoichi: *See—*
Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, B 793,920, Cl. 424-274.000.

Harmuth, Charles Moore, to Du Pont de Nemours, E. I., and Company. Thermoplastic polyvinyl chloride-acrylic powder coating composition. B 795,565, Cl. 260-28.50D.

Harnischfeger Corporation: *See—*
Fritsch, Robert A.; Gattu, Narahari; and Vaerk, Lembit, 4,112,649, Cl. 52-731.000.

Harpman, Webster B., to Energy Research Inc. Fuel system and vaporizer for internal combustion engines. 4,112,889, Cl. 123-25.00B.

Harries, David Anthony, to Girling Limited. Master cylinder assemblies. 4,112,682, Cl. 60-548.000.

Harrington, Douglas S. Process for recovering gold. B 770,466, Cl. 75-0.50A.

Harrington, Timothy Cardell; and Arthur, Hugh MacDonald, to Molins Limited. Cigarette paper splicing apparatus. B 744,880, Cl. 242-58.100.

Harris, Ernest D.: *See—*
Wheldon, Alfred G.; and Harris, Ernest D., 4,112,736, Cl. 73-23.000.

Harsch, Gustav. Portable water source. B 781,199, Cl. 222-181.000.

Harter Corporation: *See—*
Decker, Lloyd Burr, 4,112,643, Cl. 52-222.000.

Hartert, Erwin: *See—*
Distler, Harry; Schlecht, Helmut; and Hartert, Erwin, B 743,517, Cl. 260-465.50A.

Hartman, James A.: *See—*
Gregoire, Clyde G.; Hartman, James A.; and Gregoire, Joseph M., B 822,423, Cl. 270-21.000.

Hartman, Seymour, to Champion International Corporation. Process for in situ formation of a tree-derived resinous adhesive composition. B 791,565, Cl. 428-529.000.

Hartman, Wilbert, Jr. Lever-action lift jack. B 825,680, Cl. 254-131.000.

Hartwig, Karl: *See—*
Eppe, Rudolf; Schnall, Gunther; Mullritter, Ludwig; Beck, Johann; and Hartwig, Karl, B 699,341, Cl. 355-8.000.

Hasegawa, Hiroshi: *See—*
Abe, Kazunobu; Rikimaru, Hiroaki; Yamazaki, Iwao; and Hasegawa, Hiroshi, B 753,323, Cl. 252-455.00R.
Hashim, George A., to St. Luke's Hospital. Novel compounds, compositions and methods of their use. B 648,379, Cl. 424-177.000.
Hashimoto, Masashi: *See—*
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, B 640,910, Cl. 544-16.000.
Hashimoto, Shigeru: *See—*
Obinata, Shiro; Hashimoto, Shigeru; and Sahara, Takeshi, B 613,928, Cl. 209-167.000.
Hasson, Victor Haim; and von Bergmann, Hubertus Michael, to South African Inventions Development Corporation, The. Laser and its method of operation. B 692,085, Cl. 331-94.50G.
Hatcher, Charles S.; and Smith, Kenneth E., to Phillips Petroleum Company. Apparatus and process suitable for twist-drawing a yarn. 4,112,667, Cl. 57-157.00S.
Hattori, Tadashi: *See—*
Iwata, Toshiharu; Hattori, Tadashi; Mori, Kouichi; and Akiyama, Tomojiro, 4,112,885, Cl. 123-98.000.
Hauck, Frederic Peter; and Cimarusti, Christopher Michael, to E. R. Squibb & Sons, Inc. Perhydrofluorenetetrol and perhydrophenanthrenetetrol derivatives. B 446,837, Cl. 544-380.000.
Hauni-Werke Korber & Co. KG.: *See—*
Bardenhagen, Dietrich; and Schubert, Bernhard, 4,112,651, Cl. 53-449.000.
Hausenblas, Helmut; and Holzforster, Hans-Erich, to Thyssen Industrie Aktiengesellschaft. Hydropneumatic spring element. B 691,978, Cl. 280-705.000.
Hauser, Hans: *See—*
Craft, Jacob A.; and Hauser, Hans, B 800,932, Cl. 188-72.700.
Hauser, Peter Jacob; and Kuhn, Hans Heinrich, to Milliken Research Corporation. Water-soluble, non-polar solvent-soluble ethyleneoxy-propyleneoxy containing fugitial tints. B 815,122, Cl. 260-178.000.
Hauser, Raimund: *See—*
Freudenschuss, Otto, B 749,333, Cl. 356-5.000.
Hawker Siddeley Dynamics Limited: *See—*
Leek, Stanley, B 770,793, Cl. 244-3.210.
Hawkins, Thomas J.: *See—*
Wurtz, Frank R.; and Hawkins, Thomas J., B 772,270, Cl. 416-17.000.
Hayashi, Torahiko; Kageyama, Minoru; and Morikawa, Michio. Method and apparatus for continuously manufacturing multi-layered dough materials. B 665,326, Cl. 264-173.000.
Hayashi, Torahiko. Apparatus for forming dough pieces. B 712,504, Cl. 425-335.000.
Hayashizaki, Yoshihiro: *See—*
Takiura, Mamoru; and Hayashizaki, Yoshihiro, B 773,669, Cl. 264-349.000.
Haydn, Josef: *See—*
Fiege, Helmut; Haydn, Josef; Renner, Johann; and Wedemeyer, Karlfried, B 757,422, Cl. 568-756.000.
Hayes, Clyde M., to Eltra Corporation. Brush cage for a dynamoelectric machine. B 775,084, Cl. 310-241.000.
Hays, Joseph C. Wallboard laminating clip. 4,112,636, Cl. 52-98.000.
Hayward, Alan Thomas Joseph, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Flowrate meters. 4,112,757, Cl. 73-207.000.
Hayward, George J. Orthopedic shoes. 4,112,600, Cl. 36-91.000.
Hebeda, Ronald Emil: *See—*
Leach, Harry Woods; Hebeda, Ronald Emil; and Holik, Dennis John, B 721,926, Cl. 127-29.000.
Heberlein Maschinenfabrik AG: *See—*
Muhlegg, Kurt, 4,112,664, Cl. 57-77.400.
Hechenbleikner, Ingenuin; and Enlow, William Palmer, to Borg-Warner Corporation. Arbuzov rearrangement of triphenyl phosphite. B 795,461, Cl. 260-969.000.
Heckman, Raymond F.; and Torpie, John D., to Xerox Corporation. Automatic dialer having a recall memory. B 793,455, Cl. 179-90.00B.
Heckman, Raymond F.: *See—*
Gorham, Michael L.; Heckman, Raymond F.; and Yole, Charles S., B 793,453, Cl. 179-90.00B.
Hedges, Charles Vernon: *See—*
Mark, Victor; and Hedges, Charles Vernon, B 755,981, Cl. 568-750.000.
Heerdt, Ruth: *See—*
Stach, Kurt, deceased; Bosies, Elmar; Heerdt, Ruth; Kuhnle, Hans-Frieder; and Schmidt, Felix Helmut, B 674,993, Cl. 424-272.000.
Hego Electric GmbH: *See—*
Glaesel, Gottfried, B 680,411, Cl. 174-158.00R.
Hehl, Karl. Tamper-proof safety cover for injection molding machines. B 684,850, Cl. 425-152.000.
Heiba, El Ahmadi I.: *See—*
Stournas, Stamoulis; and Heiba, El Ahmadi I., B 770,164, Cl. 252-8.55D.
Heidecker, Robert F., to Dairy Systems, Inc. Milk monitoring method and apparatus. 4,112,758, Cl. 73-218.000.
Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
Jeschke, Willi, 4,112,842, Cl. 101-183.000.
Heil, Guenter: *See—*
Barzynski, Helmut; and Heil, Guenter, B 834,796, Cl. 204-159.150.
Heilweil, Israel J.: *See—*
Nnadi, John C.; and Heilweil, Israel J., B 564,954, Cl. 544-296.000.
Hein, Wolfgang; Grundmann, Peter; and Cosack, Claus. Syringes adapted to overcome a pressure resistance. B 783,714, Cl. 222-396.000.
Heinrich Wunder KG: *See—*
Zoor, Reinhold, B 746,185, Cl. 280-626.000.
Heintzelman, Leo A. Can closure. B 852,258, Cl. 220-256.000.
Heitland, Herbert; and Renger, Udo, to Volkswagenwerk Aktiengesellschaft. Internal combustion engine with a main combustion chamber and an auxiliary combustion chamber. 4,112,878, Cl. 123-32.0ST.
Held, Manfred; and Spies, Hans, to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung. Releasing device with preset response sensitivity for electrical fuzes for use with mines. 4,112,844, Cl. 102-19.200.
Helfert, Herbert; Davis, Pauls; and Langdon, William Keith, to BASF Wyandotte Corporation. Polyether polyols and method of preparing same. B 736,959, Cl. 260-615.00B.
Helfgen, Werner; Lindner, Gerhard; Lingens, Paul; and Kaufmann, Helmut, to Dynamit Nobel Aktiengesellschaft. Process for the production of flexible explosive formed charges. B 702,593, Cl. 264-3.00R.
Helixon, Michael L.; and Ward, Barry S., to Alcon Laboratories, Inc. Operator means for syringe cartridges. 4,112,945, Cl. 128-218.00D.
Hellgren, Keijo: *See—*
Claesson, Harry; and Hellgren, Keijo, 4,112,724, Cl. 72-63.000.
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., to Caterpillar Tractor Co. Composite wear-resistant alloy, and tools from same. B 733,562, Cl. 428-565.000.
Henderson, David L., to Emerson Electric Co. Method of manufacturing a corrosion resistant rotor assembly. B 663,146, Cl. 148-6.15Z.
Hendricks, Udo-Winfried: *See—*
Sackmann, Gunter; Hendricks, Udo-Winfried; Honig, Hans-Ludwig; Kolb, Gunter; and Muller, Friedhelm, B 749,455, Cl. 106-238.000.
Hendrickx, Yves. Package convertible into a display means for cut flowers. B 765,545, Cl. 206-423.000.
Henig, Yair Steve; and Purohit, Kailash S., to General Foods Corporation. Adsorption process. B 771,486, Cl. 426-422.000.
Henig, Yair Steve: *See—*
Kramer, Franklin; Henig, Yair Steve; Garin, Torunn Atteraas; and Vogel, Gerald James, B 771,485, Cl. 426-422.000.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Conrad, Jens; and Bruns, Klaus, B 765,531, Cl. 252-522.000.
Koch, Karlheinz; and Breitzke, Willi, B 741,160, Cl. 252-56.00S.
Hennegan Company, The: *See—*
Ott, Robert B.; and Heringer, Lawrence R., 4,112,604, Cl. 40-610.000.
Hennessey, Richard G.: *See—*
Coons, Robert R.; Hennessey, Richard G.; and Woffenden, John, B 811,499, Cl. 188-71.600.
Henning, George J.: *See—*
Dietz, Raymond A. F.; Fundom, Danny L.; Henning, George J.; and McKinney, Lynn B., B 744,965, Cl. 206-508.000.
Henry, Hubert H. End section for a reciprocating mower. 4,112,655, Cl. 56-301.000.
Henry, Russell Alger; and Summers, Ernest Moreland, to Wear-Cote International, Inc. Method of obtaining electroless nickel coated filled epoxy resin article. B 799,772, Cl. 427-290.000.
Hensen, Friedhelm: *See—*
Schippers, Heinz; Hensen, Friedhelm; Koslowski, Gerhard; and Czerwon, Dieter, B 722,558, Cl. 526-351.000.
Hensley, William G., to Minnesota Mining and Manufacturing Company. Traverse bar and slide. B 743,463, Cl. 242-43.00R.
Herbst, Thomas, to Dyckerhoff & Widmann Aktiengesellschaft. Removable press anchor with destructible anchor body. 4,112,637, Cl. 52-155.000.
Herbstman, Sheldon; Webb, Allen N.; and Estes, John H., to Texaco Inc. Alkylation process. B 746,766, Cl. 252-442.000.
Hercules Incorporated: *See—*
Bower, Barton Keeley, B 782,265, Cl. 260-429.500.
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., B 636,340, Cl. 260-876.00B.
Einerhand, Johan Jozef; Erkens, Leonardus Johannes Hubertus; Laenen, Rene Johannes; and Hoofs, Joseph Wilhelmus Jacobus, B 809,336, Cl. 106-304.000.
Pearson, Stephen C., B 860,423, Cl. 260-29.6PM.
Wagner, Romeo Barrick, B 789,303, Cl. 71-7.000.
Hergert, Richard E.: *See—*
Min, Tony C.; and Hergert, Richard E., 4,112,549, Cl. 19-304.000.
Heringer, Lawrence R.: *See—*
Ott, Robert B.; and Heringer, Lawrence R., 4,112,604, Cl. 40-610.000.
Hermann Berstorff Maschinenbau GmbH: *See—*
Anders, Dietmar, B 786,859, Cl. 156-431.000.
Hermann nee Voros, Judit: *See—*
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, B 728,459, Cl. 424-251.000.
Hermanns, Henry M., to Fischer & Porter Company. Variable-gradient spring sub-assembly. 4,112,960, Cl. 137-85.000.
Hermanson, Dean E.: *See—*
Curtis, William M.; and Hermanson, Dean E., B 790,963, Cl. 285-12.000.
Hermes Precisa International S.A.: *See—*
Menzi, Ulrich, B 696,864, Cl. 400-333.000.

Herrington, Richard A.: *See*—
Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., B 767,051, Cl. 225-2.000.
Herschler, Robert J. Method for the treatment of water-living animals with health modifying agents. 4,112,946, Cl. 128-253.000.
Herzog, Gerald Bernard, to RCA Corporation. Position encoder employing charge transfer circuit. B 700,120, Cl. 250-211.00K.
Hess, Hans-Jurgen E., to Pfizer Inc. Oxaprostaglandins. B 562,208, Cl. 562-503.000.
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., to Pfizer Inc. 15-Substituted-ω-pentanorprostaglandins. B 854,392, Cl. 260-347.300.
Hesse, Karl-Heinz: *See*—
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, B 809,886, Cl. 303-105.000.
Heuck, Roger W., to M. E. Heuck Company. Grill scraper. 4,112,537, Cl. 15-105.000.
Hewlett-Packard Company: *See*—
Epstein, James Stephen, B 742,941, Cl. 356-5.000.
Heyman, Duane A., to Sherwin-Williams Company, The. Process for preparing 2-benzimidazolones. B 818,172, Cl. 548-305.000.
Hi-Shear Corporation: *See*—
Wing, George S., 4,112,992, Cl. 151-29.000.
Hibbard, Earl R.: *See*—
Ganske, Kingston; Hibbard, Earl R.; Falk, Mervin L.; and Denk, Joseph P., B 786,234, Cl. 360-99.000.
Hidaka, Tsuneo: *See*—
Ebihara, Masatomi; Inoue, Masahide; and Hidaka, Tsuneo, B 802,856, Cl. 106-39.500.
Higgins, Jerry G.: *See*—
Forward, Cleve H.; and Higgins, Jerry G., B 655,205, Cl. 521-60.000.
Higgins, Larry, to Leggett & Platt, Incorporated. Box spring assembly and small diameter single cone coil spring for use in that assembly. 4,112,528, Cl. 5-248.000.
Hijikata, Setsuo: *See*—
Ozaki, Tsutomu; and Hijikata, Setsuo, B 712,952, Cl. 177-25.000.
Hile, John R. Code combination property alarm system. B 780,841, Cl. 340-528.000.
Hill, David Arthur; and Lomnitzer, Abraham. Apparatus for the use in the construction of electric circuits. 4,112,593, Cl. 35-19.00A.
Hill, Richard A.: *See*—
Fidler, Gary L.; Hill, Richard A.; and Carrera, John P., B 686,858, Cl. 176-38.000.
Hill, Robert W.; Onnen, William G.; and Ryder, Lyle C., to Ames Rubber Corporation. Method of sealing the ends of an elastomeric roll. B 719,696, Cl. 264-262.000.
Hillman, Edwin K. Solar liquid/air heater. 4,112,920, Cl. 126-271.000.
Hilti Aktiengesellschaft: *See*—
Kuhlmann, Wolf; and Rumpp, Gerhard, 4,112,813, Cl. 85-74.000.
Lippacher, Wolfgang; and Teger, Gerhard, B 791,950, Cl. 408-241.00S.
Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, to Tanabe Seiyaku Co. Ltd. 8-Azaprostanoic acid derivatives. B 793,920, Cl. 424-274.000.
Himmele, Walter: *See*—
Aquila, Werner; Hoffmann, Werner; Himmele, Walter; and Siegel, Hardo, B 494,457, Cl. 260-599.000.
Hino, Isao: *See*—
Fuse, Takeshi; Yajima, Toshio; Hino, Isao; and Oka, Shohei, B 761,278, Cl. 248-204.000.
Hioki, Katsuhiko: *See*—
Matsuura, Ryo; Nakatani, Shuichi; Nagaoka, Kazuya; and Hioki, Katsuhiko, B 818,761, Cl. 260-351.000.
Hiraishi, Yoshinobu: *See*—
Tokimoto, Tadashi; Kawaguchi, Kazumasa; Izawa, Junji; and Hiraishi, Yoshinobu, B 733,400, Cl. 423-336.000.
Hirai, Toshikiyo, to Toyo Ysushinki Kabushiki Kaisha. Bearing detection system. B 772,248, Cl. 343-119.000.
Hirota, Nobuyoshi; and Shibata, Akio, to Mitsubishi Jukogyo Kabushiki Kaisha. Coating composition for leak detection in air test. B 775,328, Cl. 260-8.000.
Hisa, Yuji: *See*—
Gomi, Teruo; Hisa, Yuji; and Soeda, Takahiko, B 790,440, Cl. 260-123.500.
Hishida, Tadashi: *See*—
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, B 780,843, Cl. 195-68.000.
Hitachi, Ltd.: *See*—
Koseki, Yasuo; Takahashi, Sankichi; and Nakaoka, Azuma, B 748,762, Cl. 210-82.000.
Mukaemachi, Takuji; Takeshita, Tetsuo; and Enami, Shiroh, B 775,619, Cl. 179-18.0ES.
Saiki, Atsushi; Okubo, Toshio; and Harada, Seiki, B 695,040, Cl. 156-656.000.
Sakanaka, Takao, 4,112,729, Cl. 72-236.000.
Shigeta, Masayuki; and Shibata, Tadashi, B 420,050, Cl. 187-1.00R.
Shiina, Fumio, B 763,083, Cl. 250-569.000.
Sugiura, Noboru; and Suda, Seiji, 4,112,903, Cl. 123-148.00E.
Terasawa, Yoshio; and Kimura, Shin, B 652,662, Cl. 357-38.000.
Yoneda, Kenji; Nakazato, Masao; and Yuminaka, Takeo, B 702,145, Cl. 187-29.00R.
Hitachi Medical Corporation: *See*—
Tomita, Chuji, B 740,720, Cl. 250-439.00R.
Hitchiner Manufacturing Co., Inc.: *See*—
Chandley, George D., 4,112,997, Cl. 164-119.000.
Hitzman, Donald O., to Phillips Petroleum Company. Hot effluent from partial oxidation of natural gas injected in oil recovery process. B 749,196, Cl. 166-303.000.
Hiya, Kohji: *See*—
Aya, Masayoshi; and Hiya, Kohji, B 808,567, Cl. 335-212.000.
Hoch, Helmut: *See*—
Rones, Josef; Moller, Siegfried; and Hoch, Helmut, B 781,820, Cl. 106-14.130.
Hochgesang, Gerhard, to Preh-Elektrofeinmechanische Werke-Jakob Preh Nachf. Electric switch. B 707,337, Cl. 200-67.00C.
Hochiki Corporation: *See*—
Yamazaki, Shunji; and Masuda, Hajime, B 833,072, Cl. 340-531.000.
Hochstrasser, Otto; and Ruby, William S., to Brown Boveri Corporation. Preheating system with gas recirculation. B 826,189, Cl. 13-2.00R.
Hochtemperatur-Kernkraftwerk GmbH (HKG) Gemeinsames Europaisches Unternehmen: *See*—
Schweiger, Fritz, B 674,483, Cl. 176-38.000.
Hodges, Robert J.: *See*—
Jackson, Thomas M.; and Hodges, Robert J., B 732,500, Cl. 350-96.200.
Hodne, Ingard B.: *See*—
Geis, David G.; and Hodne, Ingard B., B 816,823, Cl. 335-270.000.
Hoechst Aktiengesellschaft: *See*—
Andrascheck, Hans-Joachim; and Mucke, Rainer, B 721,276, Cl. 260-28.50D.
Frey, Hans-Helmut; and Klug, Helmut, B 849,161, Cl. 260-897.00C.
Fuchs, Hermann; and Filzinger, Klaus, B 765,004, Cl. 260-149.000.
Kruse, Hubert; and Opitz, Konrad, B 690,023, Cl. 8-90.000.
Linkies, Adolf; Reuschling, Dieter-Bernd; Kuhlein, Klaus; Beck, Gerhard; and Musil, Josef, B 751,173, Cl. 424-274.000.
Papenfuhs, Theodor; and Volk, Heinrich, B 799,001, Cl. 260-439.00R.
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; Auel, Theodor; and Kloss, Werner, B 815,160, Cl. 423-265.000.
Hoesch Werke Aktiengesellschaft: *See*—
Steinfeld, Horst E.; and Mathes, Dieter, B 762,347, Cl. 238-349.000.
Hoff, Siebe; Ockers, Gerhardus; Buitelaar, Arnold A.; and Van De Kraats, Eduard J., to Shell Oil Company. Middle distillate fuel compositions. B 779,645, Cl. 44-66.000.
Hoffman, Robert K.; and Franson, David C., to Parker-Hannifin Corporation. Automatic drain valve for a compressed air system. 4,112,968, Cl. 137-427.000.
Hoffmann-La Roche Inc.: *See*—
Cohen, Michael Robert; Kierstead, Richard Wightman; and Tilley, Jefferson Wright, B 844,570, Cl. 260-565.000.
Cohen, Noal; and Saucy, Gabriel, B 797,712, Cl. 260-340.90R.
Mohacsi, Ernest, B 811,233, Cl. 260-285.000.
Hoffmann, Werner: *See*—
Aquila, Werner; Hoffmann, Werner; Himmele, Walter; and Siegel, Hardo, B 494,457, Cl. 260-599.000.
Hoffstadt, Walter F.: *See*—
Tracy, David J.; and Hoffstadt, Walter F., B 742,058, Cl. 548-365.000.
Hofmann, Franz; and Szatmari, Franz, to Georg Fischer Aktiengesellschaft. Drum mixer. B 729,979, Cl. 366-56.000.
Hohne, Gerd: *See*—
Manger, Hansjorg; Sohner, Gerhard; and Hohne, Gerd, 4,112,890, Cl. 123-117.00R.
Holcomb, Norman L.: *See*—
Wardwell, Charles H.; and Holcomb, Norman L., 4,112,812, Cl. 85-46.000.
Holcombe, Frank O., Jr., to Burton, Parsons and Company, Inc. Hydrophilic contact lenses and lens polymer. B 805,146, Cl. 260-29.6TA.
Holcroft & Company: *See*—
Meyer, Robert W.; and Hall, George A., III, B 771,458, Cl. 165-154.000.
Holen, J. Robert: *See*—
Sutton, Stephen J.; Holen, J. Robert; and Creager, John E., B 854,711, Cl. 338-33.000.
Holik, Dennis John: *See*—
Leach, Harry Woods; Hebeda, Ronald Emil; and Holik, Dennis John, B 721,926, Cl. 127-29.000.
Holland, Johannes; and Wagemans, Hubertus Franciscus Marie, to U.S. Philips Corporation. Device for taking a liquid sample. 4,112,768, Cl. 73-422.00R.
Hollander, Harry. Ultrasonic television remote control system. B 751,181, Cl. 325-392.000.
Hollingsworth, Richard James, to RCA Corporation. Unbalanced sense circuit. B 796,333, Cl. 307-362.000.
Holloway, Thomas C.: *See*—
Fu, Horng-sen; Holloway, Thomas C.; Tasch, Al F., Jr.; and Chatterjee, Pallab K., 4,112,575, Cl. 29-577.00C.
Hollweck, Walter, to Inter Control Hermann Kohler Elektrik GmbH & Co. KG. Expansion diaphragm-type temperature sensor. 4,112,765, Cl. 73-368.300.
Holly, Harry H., to Hollymatic Corporation. Molding apparatus. B 825,651, Cl. 425-542.000.
Hollymatic Corporation: *See*—
Holly, Harry H., B 825,651, Cl. 425-542.000.
Holm, LeRoy W.: *See*—
Bernard, George G.; and Holm, LeRoy W., B 774,920, Cl. 166-273.000.
Holman, Robert R.; and Turkall, Daniel N., to Electric Power Research

Institute, Inc. Releasable, high-pressure seal and method of forming same. B 737,761, Cl. 277-1.000.

Holmer, Donald A.: *See*—
Chapman, Richard D.; Holmer, Donald A.; and Mortimer, George A., B 759,313, Cl. 528-313.000.

Holmes, Bruce: *See*—
Ashdown, Glynn R.; McCartney, Thomas; and Holmes, Bruce, B 622,054, Cl. 179-175.30R.

Holt, David: *See*—
McLean, Graham Wilson; and Holt, David, B 797,252, Cl. 310-163.000.

Holtmeier, Gerhard: *See*—
Stemmann, Karl; and Holtmeier, Gerhard, B 688,269, Cl. 191-67.000.

Holtschmidt, Ulrich: *See*—
Laqua, Arnold; and Holtschmidt, Ulrich, B 793,315, Cl. 260-29.40R.

Holzforster, Hans-Erich: *See*—
Hausenblas, Helmut; and Holzforster, Hans-Erich, B 691,978, Cl. 280-705.000.

Homeyer, Bernhard: *See*—
Maurer, Fritz; Riebel, Hans-Jochem; Homeyer, Bernhard; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, B 645,128, Cl. 424-200.000.
Siegle, Peter; Kuhle, Engelbert; Hammann, Ingeborg; Homeyer, Bernhard; and Behrenz, Wolfgang, B 592,860, Cl. 424-278.000.

Hon Man, Luk. Safety electric receptacle and the plug. B 605,767, Cl. 339-75.00P.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Okunishi, Hiromu; Nakaji, Hideki; Suwa, Hiroyuki; and Sato, Hideaki, 4,112,732, Cl. 72-334.000.

Honeywell Inc.: *See*—
Del Monte, Louis A., B 809,960, Cl. 204-15.000.

Honig, Hans-Ludwig: *See*—
Sackmann, Gunter; Hendricks, Udo-Winfried; Honig, Hans-Ludwig; Kolb, Gunter; and Muller, Friedhelm, B 749,455, Cl. 106-238.000.

Hood, John Dick: *See*—
Cole, Martin; Hood, John Dick; and Butterworth, Dennis, B 717,334, Cl. 424-117.000.

Hoofs, Joseph Wilhelmus Jacobus: *See*—
Einerhand, Johan Jozef; Erkens, Leonardus Johannes Hubertus; Laenen, Rene Johannes; and Hoofs, Joseph Wilhelmus Jacobus, B 809,336, Cl. 106-304.000.

Hooker Chemicals & Plastics Corp.: *See*—
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., B 850,194, Cl. 429-33.000.

Hoppen, Heinz; and Fasbender, Heinz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method and apparatus for drying and grinding. B 787,598, Cl. 241-24.000.

Horie, Eizi: *See*—
Suzuki, Hiroshige; Horie, Eizi; and Nagashima, Hideo, 4,112,648, Cl. 52-508.000.

Horna, Otakar Anthony, to Communications Satellite, Corporation. Analog to digital signal of logarithmic format converter and analog to pseudo-rms value converter and echo canceller utilizing same. B 814,942, Cl. 179-170.200.

Hornsby, Isaac W. Micrometer jig. 4,112,581, Cl. 33-174.00R.

Horowitz, Charles, to Sloan Valve Company. Electrical connector receptacle. B 799,506, Cl. 339-14.00P.

Horowitz, Charles, to Sloan Valve Company. Tractor protection valve. 4,112,961, Cl. 137-102.000.

Horstmann, Harald: *See*—
Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, B 693,971, Cl. 548-377.000.
Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, B 766,235, Cl. 424-273.00P.

Horvay, Julius B., to General Electric Company. Refrigerator cabinet and method of constructing. B 749,164, Cl. 312-214.000.

Horwitz, Thomas L.: *See*—
Golembeck, Gerald A.; and Horwitz, Thomas L., 4,112,529, Cl. 5-354.000.

Hosoya, Katsumi: *See*—
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, B 231,001, Cl. 96-60.00R.

Hosoya, Kazuo; and Kubota, Munetaka, to Kajima Kensetsu Kabushiki Kaisha. Method and construction of underground tank well. 4,112,690, Cl. 405-57.000.

Hotta, Hisashi; and Mori, Fumio, to Toyo Seikan Kaisha Ltd. Olefin resin-metal bonded structure. B 808,301, Cl. 156-306.000.

Hotz, Roger D.: *See*—
Stach, Leonard J.; Hotz, Roger D.; and Richter, Sidney B., B 784,212, Cl. 71-88.000.

Hounsfield, Godfrey Newbold, to EMI Limited. Radiography. B 655,396, Cl. 250-445.00T.

Hovengen, Oyvind. Washer for nyloprint printing blocks or the like. 4,112,534, Cl. 15-77.000.

Howard, Charles S. Pill-dispensing and storage container. B 800,351, Cl. 206-540.000.

Howard, James Lynn, to Phifer, Earl Cooper, a part interest. Apparatus for matching wires in multiple wire conductors and attendant method. B 799,379, Cl. 324-66.000.

Howard, Robert N., to Minnesota Mining and Manufacturing Company. Encapsulated abrasive grains and articles made therefrom. 4,112,631, Cl. 51-295.000.

Howell, Stephen Louis: *See*—
Robinson, John William; Crosby, Thomas C.; and Howell, Stephen Louis, 4,112,802, Cl. 84-1.010.

Howmedica Inc.: *See*—
Rosenthal, Arthur Lee; Alpern, Marvin; and Meisch, Charles Edward, 4,112,949, Cl. 128-278.000.

Hoyer, Rudolf: *See*—
Stiltz, Erwin; Hoyer, Rudolf; and Lindenmayer, Heinz, B 789,680, Cl. 173-116.000.

HP Kolinska Ljubljana Prehrambena Indsutrija (n.sol.o.): *See*—
Krasovec, Branko; Mihelic, Eli; and Reutlinger, Suzana, B 778,319, Cl. 426-56.000.

Hubelbank, Mark: *See*—
Feldman, Charles L.; and Hubelbank, Mark, 4,112,930, Cl. 128-2.06R.

Huber, Leonhard; Kirschner, Helmut; and Muller, Herbert, to Agfa-Gevaert AG. Shutter mechanism. B 763,684, Cl. 354-252.000.

Huber, Wolfgang: *See*—
Tippmann, Heinrich; and Huber, Wolfgang, 4,112,787, Cl. 74-798.000.

Hubner, Wolfgang; Barthell, Eduard; and Dahmen, Kurt, to Chemische Fabrik Stockhausen & Cie. Flocculating agent comprising water-in-oil emulsion of stabilizer plus NH-active polymer carrying formaldehyde and amine radicals. B 682,543, Cl. 260-29.4UA.

Hudelmaier, Gerhard. Device for the control of concrete manufacture in truck concrete mixers. B 679,716, Cl. 366-2.000.

Hudson, George Elbert, III; and Clark, Arthur E., to United States of America, Navy. Heat transfer system using thermally-operated, heat-conducting valves. 4,112,699, Cl. 62-3.000.

Hufendiek, Ernst-Wilhelm, to Daimler-Benz Aktiengesellschaft. Rotational speed governor for an injection pump in air-compressing injection internal combustion engines. 4,112,897, Cl. 123-139.0ST.

Huff, Peter C. Integrated pneumatic logic module. 4,112,962, Cl. 137-119.000.

Huffman, Hubert L.: *See*—
Benham, Harold L.; Clark, Steven D.; Huffman, Hubert L.; and Stovall, Ronald J., B 806,799, Cl. 320-39.000.

Hughes Aircraft Company: *See*—
Zanio, Kenneth W.; and Fraas, Lewis M., B 735,560, Cl. 148-174.000.

Hughes, Donald Wayne Kent, to AMP Incorporated. Electrical connector having provision for circuit components. B 824,023, Cl. 339-147.00R.

Hugl, Herbert; Schundehutte, Karl Heinz; Trautner, Kersten; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Process for dyeing fibre materials. B 813,311, Cl. 8-41.00R.

Hulka, Jaroslav Fabian; and Clemens, George Selden, to Research Corporation. Surgical clip. 4,112,951, Cl. 128-346.000.

Hull, Robert E.; and Gemp, Robert S., to Westinghouse Electric Corp. Load balancing system for ups rectifiers. B 816,556, Cl. 307-53.000.

Hull, Robert L.: *See*—
Watson, Albert T.; and Hull, Robert L., B 718,846, Cl. 260-897.00A.

Huly, William; and Brouillette, Rudolph G., to United Technologies Corporation. Apparatus and means for permanently marking a buoyant mine which has been severed from its mooring wire during mine sweeping operations. 4,112,862, Cl. 114-221.00R.

Humber, David Cedric: *See*—
Laundon, Brian; Cowley, Brian Richard; and Humber, David Cedric, B 749,300, Cl. 204-158.0HA.

Humes, Norman S.: *See*—
Uhtenwoldt, Herbert R.; and Humes, Norman S., 4,112,624, Cl. 51-5.00D.

Humlong, Robert F.: *See*—
Pawsat, Carlton P.; and Humlong, Robert F., B 782,662, Cl. 403-22.000.

Humphrey Instruments, Inc.: *See*—
Humphrey, William E., B 790,203, Cl. 351-17.000.

Humphrey, William E., to Humphrey Instruments, Inc. Process and apparatus for astigmatic and spherical subjective testing of the eye. B 790,203, Cl. 351-17.000.

Hunka, George William, to RCA Corporation. Optical cursor tracking correction system. B 782,754, Cl. 250-202.000.

Hunsicker, Monroe T. Rural mailbox delivery signal. B 819,013, Cl. 232-35.000.

Hunts, Ronald M.: *See*—
Strange, Delbert D.; and Hunts, Ronald M., 4,112,986, Cl. 144-323.000.

Huper, Fritz; and Oberheiden, Helmut, to Bayer Aktiengesellschaft. Process for purifying products obtained from enzymatic cleavage of beta-lactam antibiotics. B 692,876, Cl. 544-20.000.

Hurst, Thomas L., to A. E. Staley Manufacturing Company. Glucose isomerization with iron ion-thiol activator ion-glucose isomerase systems. B 750,332, Cl. 195-31.00F.

Huston, Henry H., to Weird Products Ltd. Amusement device requiring concentration and coordination. B 774,372, Cl. 273-96.00R.

Hutchings, David Roy. Dual nature puzzle pieces. B 802,253, Cl. 273-160.000.

Hutkin, Irving J. Method of making a thin-copper foil-carrier composite. B 697,045, Cl. 204-13.000.

Huyck Corporation: *See*—
Lefkowitz, Leonard R.; and Krohn, W. Henrik, B 832,316, Cl. 156-148.000.

Hyman, Oscar E., to Imed Corporation. Automatic air-in-line fluid detector. B 713,664, Cl. 340-632.000.

Ichida, Toshio: *See—*
Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, B 760,376, Cl. 148-113.000.

Idel, Vladimir Viktorovich. Machine for working saw teeth. 4,112,789, Cl. 76-58.000.

Ideue, Kazuo: *See—*
Mizuno, Michitaka; Ideue, Kazuo; and Oya, Masashi, 4,112,759, Cl. 73-295.000.

IDN Inventions and Development of Novelties AG: *See—*
Ackeret, Peter, B 583,756, Cl. 206-387.000.

Iemori, Toshiaki: *See—*
Yamaguchi, Hisashi; Sato, Seii; Iemori, Toshiaki; and Andoh, Shizuo, B 767,690, Cl. 315-169.0TV.

Igarashi, Toshiji; and Nakajima, Yoshikage, to Eisai Co., Ltd. Method for treatment of hypertension. B 821,910, Cl. 424-266.000.

Ignatyev, Alexandr Dmitrievich: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.

Iida, Hideo, to Nippon Hume Pipe Company Limited. Method of manufacturing prestressed concrete pipe. B 715,493, Cl. 264-228.000.

Iida, Kazuyoshi: *See—*
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; and Suzuki, Shosuke, B 730,115, Cl. 181-284.000.

Iijima, Yoo: *See—*
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, B 231,001, Cl. 96-60.00R.

Ikawa, Reiji, to Tokyo Special Wire Netting Co., Ltd. Distillation column packing. B 809,329, Cl. 261-98.000.

Ikeda, Masanori: *See—*
Tanabe, Masanori; Ikeda, Masanori; and Tamura, Nobuhiro, B 786,325, Cl. 560-244.000.

Ikegai Tekko Kabushiki Kaisha: *See—*
Takiura, Mamoru; and Hayashizaki, Yoshihiro, B 773,669, Cl. 264-349.000.

Ikeguchi, Takashi: *See—*
Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, B 720,502, Cl. 209-1.000.

Ilieve, Peter John, to Decca Limited. Clamping circuits for television signals. B 811,877, Cl. 358-34.000.

Illinois Tool Works Inc.: *See—*
Rapata, George M., B 810,532, Cl. 339-113.00R.

Imai, Nobuo: *See—*
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, B 780,843, Cl. 195-68.000.

Imai, Toshihiro: *See—*
Yamasita, Nobuo; and Imai, Toshihiro, B 773,408, Cl. 350-172.000.

IMASCO Limited: *See—*
Poskitt, Walter Edward, B 715,170, Cl. 324-61.0QS.

Imed Corporation: *See—*
Hyman, Oscar E., B 713,664, Cl. 340-632.000.

Imes, Jack, Jr., to RB Toy Development Co. Target game. B 753,171, Cl. 273-95.00R.

Impastato, Leona R. Color coordinating implement. 4,112,594, Cl. 35-28.300.

Imperial Chemical Industries Limited: *See—*
Bagnall, Robert David, B 677,855, Cl. 424-342.000.
Jones, Geraint; and Thomson, David Summers, B 747,995, Cl. 424-304.000.
Parton, Brian, B 648,568, Cl. 260-146.00R.
Price, Brian George, B 580,147, Cl. 260-885.000.
Rose, John Brewster; and Staniland, Philip Anthony, B 810,355, Cl. 528-126.000.
Shephard, Margaret Claire; Sugavanam, Balsubramanyan; Worthington, Paul Anthony; Collins, David John; and Griffin, David, B 750,017, Cl. 71-92.000.
Staniland, Philip Anthony, B 767,333, Cl. 528-481.000.

In Situ Technology, Inc.: *See—*
Terry, Ruel Carlton, B 797,536, Cl. 299-4.000.

Inagaki, Syotaro: *See—*
Nakamura, Yoshihiro; Shibazaki, Kenji; Kono, Tateomi; Inagaki, Syotaro; and Murata, Tomoji, B 736,189, Cl. 355-14.000.

Indesit Industria Elettrodomestici Italiana S.p.A.: *See—*
Campioni, Armando, B 793,344, Cl. 330-267.000.

Industrie Pirelli Societa per Azioni: *See—*
Ferrentino, Antonio; and Brovedan, Antonio, 4,112,660, Cl. 57-59.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Fiorenza, Giorgio, B 722,506, Cl. 235-375.000.

Ingersoll-Rand Company: *See—*
Larson, John Arden; and Fischer, Robert Bowlby, B 819,355, Cl. 148-36.000.

Inoue, Haruo: *See—*
Sano, Takezo; Kobayashi, Akira; and Inoue, Haruo, B 699,255, Cl. 521-29.000.

Inoue, Hiromitsu; Ohashi, Hiroshi; and Katayama, Susumu, to Matsushita Electric Works, Ltd. Ultrasonic wave watching device of moving object detecting type. B 719,159, Cl. 340-558.000.

Inoue, Kashirou: *See—*
Tanaka, Shinzo; Tsubamoto, Shinichi; Yamashita, Koichi; Eguchi, Tadashi; and Inoue, Kashirou, B 709,088, Cl. 23-232.00R.

Inoue, Masahide: *See—*
Ebihara, Masatomi; Inoue, Masahide; and Hidaka, Tsuneo, B 802,856, Cl. 106-39.500.

Inoue, Shoji: *See—*
Lagow, Richard J.; and Inoue, Shoji, B 597,937, Cl. 562-583.000.

Inoue, Yoshiaki: *See—*
Yoshikawa, Yoshio; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, B 751,668, Cl. 252-428.000.

Institut de Recherches Chimiques et Biologiques Appliquees: *See—*
Debat, Jacques, B 673,915, Cl. 424-278.000.

Institut Francais du Petrole: *See—*
Cheron, Jacques, B 727,804, Cl. 429-36.000.
Cohen, Choua; and Sillion, Bernard, B 821,054, Cl. 252-51.50A.

Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst: *See—*
Teodorescu, Constantin, B 678,728, Cl. 181-220.000.

Instone, John C., to SGL Industries, Inc. Electrical outlet strip. B 817,849, Cl. 339-22.00R.

Insurance Technology Company: *See—*
Ganske, Kingston; Hibbard, Earl R.; Falk, Mervin L.; and Denk, Joseph P., B 786,234, Cl. 360-99.000.

Inter Control Hermann Kohler Elektrik GmbH & Co. KG: *See—*
Hollweck, Walter, 4,112,765, Cl. 73-368.300.

International Business Machines Corporation: *See—*
Ayers, Robert Lee; and Hamaker, Raymond Weaver, B 736,646, Cl. 148-1.500.
Bassous, Ernest; and Liu, Cheng-Yih, B 861,373, Cl. 156-662.000.
Boyd, William Weller; Grafe, Robert Joseph; and Pingry, Carl Oscar, III, B 762,376, Cl. 340-147.00R.
Bush, Robert F.; and Mitchell, Joseph W., B 799,034, Cl. 148-6.350.
Colglazier, Donald Francis; Fallon, John Leslie; Kollar, Ernest Paul; and Mares, Fred Ralph, B 788,570, Cl. 271-10.000.
Karnaugh, Maurice, B 796,296, Cl. 340-166.00R.
Pole, Robert Vladimir; and Werlich, Harald Willy, B 798,042, Cl. 350-3.710.
Rollo, Anita Hand; and Stearns, David Burrell, B 749,585, Cl. 210-22.00A.

International Harvester Company: *See—*
Coons, Robert R.; Hennessey, Richard G.; and Woffenden, John, B 811,499, Cl. 188-71.600.
Deli, Jack M., 4,112,574, Cl. 29-527.100.
Picha, Donald A., 4,112,654, Cl. 56-98.000.

International Paper Company: *See—*
Nehring, John R., 4,112,947, Cl. 128-278.000.

International Standard Electric Corporation: *See—*
Jackson, Thomas M.; and Hodges, Robert J., B 732,500, Cl. 350-96.200.

Inui, Tsuneo: *See—*
Tsutsui, Nobuyuki; Inui, Tsuneo; and Kawamura, Hiroaki, B 818,099, Cl. 204-37.00T.

Ioffe, Benyamin Alexandrovich: *See—*
Ryzhov, Vladimir Dmitrievich; Litvinenko, Semen Kirillovich; Leikin, Roman Samuilovich; Kulberg, Anton Yanovich; Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich, B 704,693, Cl. 221-171.000.

Iowa State University Research Foundation: *See—*
Larock, Richard C., B 798,092, Cl. 260-429.00L.

Ireland, Graham A.: *See—*
MacLennan, P. H. Barry; Ireland, Graham A.; and Werba, William J., 4,112,756, Cl. 73-181.000.

Irma Ungerer Geb. Dollinger: *See—*
Rodach, Alexander, B 779,465, Cl. 242-78.300.

Ishidoshiro, Hiroshi: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,112,713, Cl. 68-5.00E.

Ishiguro, Shoji: *See—*
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, B 231,001, Cl. 96-60.00R.

Ishikawa, Kikuichi: *See—*
Oshio, Hiromichi; Konishi, Hiroyuki; Matsumura, Shiunzi; Ishikawa, Kikuichi; and Yoneyama, Eiichi, B 776,618, Cl. 71-76.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, B 771,665, Cl. 431-1.000.
Nakada, Tetsuro; Shimizu, Makoto; and Yoshinaga, Mayumi, B 864,252, Cl. 266-137.000.
Yoshizawa, Isamu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,112,798, Cl. 83-344.000.

Ishimoto, Zenichi, to Nikko Co., Ltd. Remote control system for a movable toy vehicle. 4,112,615, Cl. 46-254.000.

Ishiwata, Samford P., to Texaco Inc. Liquid level measuring device. 4,112,760, Cl. 73-299.000.

Ishizawa, Hideo: *See—*
Matsunaga, Kazuo; Ishizawa, Hideo; and Kurata, Kenichi, B 735,523, Cl. 96-38.100.

Isobe, Minoru, to Oki Electric Industry Co., Ltd. Pack for endless ink ribbon cartridge. B 691,200, Cl. 206-388.000.

Isozaki, Hiroshi: *See—*
Yoshizawa, Isamu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,112,798, Cl. 83-344.000.

Itani, Takashi: *See*—
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, B 736,223, Cl. 352-194.000.
Itaya, Yoshiro: *See*—
Shimizu, Junichi; Hara, Takashi; Iwakura, Tatsuya; and Itaya, Yoshiro, B 717,322, Cl. 426-602.000.
Itek Corporation: *See*—
Wirtz, John Stanley, B 773,568, Cl. 355-55.000.
Itoh, Hatuhide: *See*—
Kawabe, Takamasa; Kadoma, Masaaki; Murakami, Kazuyoshi; and Itoh, Hatuhide, B 748,473, Cl. 260-348.220.
Itoh, Hiroyuki; Mitsuhashi, Kenhachi; and Akashi, Hiromitsu, to Yokohama Rubber Co., Ltd., The; and Fuji Telecasting Co., Ltd. Optoelectronic tensile testing system. 4,112,746, Cl. 73-95.000.
Itoh, Tadanao, to Ricoh Company, Ltd.; and Ricoh Educational Equipment Co., Ltd. Recording reproducer for magnetic cards. B 731,679, Cl. 360-2.000.
Itoh, Tsutomu; Furuya, Nobuo; and Ohuchi, Kenji, to Onoda Cement Co., Ltd. Apparatus for forming a powder layer on the surface of a metallic squeeze-out tube. 4,112,869, Cl. 118-623.000.
Itoi, Kazuo: *See*—
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, B 616,998, Cl. 560-124.000.
ITT Industries, Inc.: *See*—
Bleckmann, Hans W., B 772,798, Cl. 303-92.000.
Tippmann, Heinrich; and Huber, Wolfgang, 4,112,787, Cl. 74-798.000.
ITW-Ateco G.m.b.H.: *See*—
Schenk, Bernd, B 741,187, Cl. 296-1.00C.
Iura, Yukio: *See*—
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Shimizu, Masami; Yoshikawa, Ryoichi; and Aizawa, Hiroshi, B 758,200, Cl. 354-238.000.
Ivanov, Valentin Nikolaevich; and Chulkova, Anna Davydovna. Suspension for making molds in disposable pattern casting. B 668,185, Cl. 106-38.350.
Iwakura, Tatsuya: *See*—
Shimizu, Junichi; Hara, Takashi; Iwakura, Tatsuya; and Itaya, Yoshiro, B 717,322, Cl. 426-602.000.
Iwano, Haruhiko: *See*—
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, B 231,001, Cl. 96-60.00R.
Iwase, Kozi: *See*—
Nakaoka, Kazuhide; Araki, Kenzi; Nishimoto, Akihiko; Iwase, Kozi; and Kubotera, Haruo, B 713,793, Cl. 148-2.000.
Iwata, Toshiharu; Hattori, Tadashi; Mori, Kouichi; and Akiyama, Tomojiro, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Throttle valve control system for an internal combustion engine. 4,112,885, Cl. 123-98.000.
Iyeta, Motoi, to Nippon Gakki Seizo Kabushiki Kaisha. Tone pickup arm device keeping excellent dynamic lateral balance and damping effect. B 786,392, Cl. 274-23.00R.
Izaki, Hiroshi: *See*—
Fukuta, Shigemi; Izaki, Hiroshi; and Yoshino, Shoichi, B 712,068, Cl. 164-286.000.
Izawa, Junji: *See*—
Tokimoto, Tadashi; Kawaguchi, Kazumasa; Izawa, Junji; and Hiraishi, Yoshinobu, B 733,400, Cl. 423-336.000.
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, to Asahi-Dow Limited; and Sanko Kaihatsu Kagaku Kenkyusho. Flame-retardant polyphenylene ether resin composition. B 812,737, Cl. 260-874.000.
Izon Corporation: *See*—
Yevick, George J., B 714,215, Cl. 350-96.250.
Yevick, George J., B 785,039, Cl. 354-102.000.
J. G. Sylvester Associates, Inc.: *See*—
Sylvester, Bruce J.; and Sylvester, Roger P., 4,112,775, Cl. 73-627.000.
J. I. Case Company: *See*—
Venable, Phillip G., B 818,702, Cl. 172-667.000.
Jackson, Thomas M.; and Hodges, Robert J., to International Standard Electric Corporation. Method of making optical fiber terminations. B 732,500, Cl. 350-96.200.
Jaeger, Dennis A. Machine gun rack. B 848,012, Cl. 211-4.000.
Jaekel, Gunter R. Adjustable check valve. 4,112,959, Cl. 137-504.000.
Janome Sewing Machine Co., Ltd.: *See*—
Kakinuma, Toshihide; Kume, Toshiaki; Takenoya, Hideaki; Makabe, Hachiro; and Watanabe, Kazuo, 4,112,858, Cl. 112-158.00E.
Janvari, Erzsebet, nee Kanyo: *See*—
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, B 728,459, Cl. 424-251.000.
Japan Atomic Energy Research Institute: *See*—
Hagiwara, Miyuki; Araki, Kunio; Matsuoka, Shingo; and Fujimura, Syunichi, B 639,066, Cl. 204-159.170.
Japan Exlan Company Limited: *See*—
Fukushima, Keitaro; Kusunose, Takamaro; and Nosaka, Yoshinori, B 719,504, Cl. 423-447.400.
Jeck, Arnulf: *See*—
Gettert, Hans; Jeck, Arnulf; and Werner, Dietmar, B 861,744, Cl. 48-197.00R.
Jeffrey, Ian Campbell, to Dobson Park Industries Limited. Vehicle or carriage mounted materials transporting machine. B 617,088, Cl. 214-141.000.
Jellinek, Karl: *See*—
Gardziella, Arno; and Jellinek, Karl, B 650,649, Cl. 427-195.000.
Jenaer Glaswerk Schott & Gen.: *See*—
Kiefer, Werner, B 637,424, Cl. 428-34.000.
Jennings Compound Bow, Inc.: *See*—
Caldwell, Joseph M., 4,112,909, Cl. 124-23.00R.
Jeretin, Stojan, to Dragerwerk Aktiengesellschaft. Device for controlling the respiration in respirators. 4,112,938, Cl. 128-142.00R.
Jeschke, Willi, to Heidelberger Druckmaschinen Aktiengesellschaft. Drive for sheet-fed rotary printing presses with at least two tandem-mounted printing units. 4,112,842, Cl. 101-183.000.
Johansson, Hans A. Shower-bath tub. 4,112,524, Cl. 4-148.000.
Johansson, Ingvar, to Svenska Traforskningsinstitutet. Method of joining wood products. B 822,517, Cl. 156-335.000.
John, Peter: *See*—
Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, B 808,767, Cl. 260-448.20E.
John Zink Company: *See*—
Cantrell, Clifford J., Jr., B 789,939, Cl. 165-40.000.
Johnson, David R., to Dow Chemical Company, The. Method to produce multivalent metals from fused bath and metal electrowinning feed cathode apparatus. B 722,851, Cl. 204-64.00R.
Johnson, David W.; and Johnson, Gary C. Rotating magnus tubes. B 729,195, Cl. 296-1.00S.
Johnson, Gary C.: *See*—
Johnson, David W.; and Johnson, Gary C., B 729,195, Cl. 296-1.00S.
Johnson & Johnson: *See*—
Turner, Robert B., B 758,629, Cl. 307-310.000.
Turner, Robert B., 4,112,764, Cl. 73-362.0AR.
Turner, Robert Bruce; Menzin, Marvin; Robinson, Hugh A.; and Williams, Thomas S., 4,112,762, Cl. 73-343.00R.
Johnson, Michael R.: *See*—
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., B 854,392, Cl. 260-347.300.
Johnson, Peter E.; and Rowland, Bob G., to Evans Products Company. Battery separator having coated ribs. B 604,350, Cl. 429-143.000.
Johnson, Richard A., to Halcon International, Inc. Conversion of mono-valent thallium to tri-valent thallium. B 740,147, Cl. 260-429.00R.
Jones, Alan Philip, to Saunders Valve Company Limited. Fluid flow control valves. B 761,900, Cl. 264-269.000.
Jones, Geraint; and Thomson, David Summers, to Imperial Chemical Industries Limited. Pharmaceutical compositions and method of use. B 747,995, Cl. 424-304.000.
Jones, John Leslie, to California Institute Research Foundation. Smokeless slow burning cast propellant. 4,112,849, Cl. 102-103.000.
Jones, Lawrence T.: *See*—
Sims, Anson; and Jones, Lawrence T., B 723,815, Cl. 273-249.000.
Jones, Robert D., to United States of America, Energy. Apparatus for controlling coolant level in a liquid-metal-cooled nuclear reactor. B 789,154, Cl. 176-40.000.
Jones, Thornton K.: *See*—
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., B 811,504, Cl. 148-23.000.
Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., B 811,505, Cl. 148-23.000.
Jones, Trevor E.: *See*—
Collins, John D.; and Jones, Trevor E., B 781,118, Cl. 260-429.700.
Jordan, Edgar R. Reinforced aperture in molded plastic article. B 720,107, Cl. 403-267.000.
Joseph, Adrian: *See*—
Severdia, Anton; and Joseph, Adrian, 4,112,832, Cl. 99-421.0HH.
Jos. Dyson & Sons, Inc.: *See*—
Foss, Richard W., B 776,283, Cl. 214-750.000.
Joseph, Raymond, to Ateliers Reunis Societe Anonyme. Wire-netting baskets, basket heightening devices and the like. B 815,366, Cl. 220-19.000.
Joseph, Robert. Jewelry article with radiometer therein. 4,112,707, Cl. 63-31.000.
Joyce, Patrick J.: *See*—
Leveen, Harry H.; and Joyce, Patrick J., B 677,135, Cl. 424-28.000.
Jozwiak, Edward L., Jr.; and Das, Suryya K., to PPG Industries, Inc. Method for electrodeposition. B 804,410, Cl. 204-181.00R.
Juichi, Imamura; Masahiko, Takehara; and Kazuhiro, Kizawa, to Agency of Industrial Science and Technology. Process for the preparation of formylated phenoxy compounds. B 657,887, Cl. 260-600.00R.
Julius Blum Gesellschaft M.B.H.: *See*—
Rock, Erich; and Mages, Bernhard, 4,112,543, Cl. 16-164.000.
Jurovsky, Abram Zinovievich: *See*—
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, B 702,208, Cl. 423-131.000.
Jutte, Hans; and Weber, Helmut. Drive shield. 4,112,696, Cl. 405-145.000.
Juusela, Jyrki Tapani: *See*—
Aaltonen, Olavi August; and Juusela, Jyrki Tapani, B 647,506, Cl. 75-74.000.

Kabs, Klaus: *See*—
Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, B 827,771, Cl. 260-463.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Kaneko, Noboru, 4,112,669, Cl. 58-4.00A.

Kabushiki Kaisha Saginomiya Seisakusho: *See*—
Kaneko, Moriwo, 4,112,704, Cl. 62-217.000.

Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, B 750,845, Cl. 156-384.000.

Kabushiki Kaisha Seikosha: *See*—
Fujita, Masanori; and Suzuki, Sukenori, B 751,730, Cl. 174-88.00R.

Kabushiki Kaisha Suwa Seikosha: *See*—
Minowa, Masahiro, B 736,046, Cl. 400-120.000.
Morozumi, Shinji, 4,112,670, Cl. 58-23.00A.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Suzuki, Yoshihisa; Sugiura, Katuaki; Suzuki, Osamu; and Tashiro, Ichiro, 4,112,661, Cl. 57-34.00R.

Kabushiki Kaisha Yachiyo Kogyo Kenkyusho: *See*—
Yoshio, Hashimoto, B 805,840, Cl. 214-1.0BB.

Kadoma, Masaaki: *See*—
Kawabe, Takamasa; Kadoma, Masaaki; Murakami, Kazuyoshi; and Itoh, Hatuhide, B 748,473, Cl. 260-348.220.

Kadowaki, Shunichi: *See*—
Asano, Masaharu; and Kadowaki, Shunichi, 4,112,880, Cl. 123-32.0EE.

Kaeding, Warren W.; and Young, Lewis Brewster, to Mobil Oil Corporation. Selective production of para-xylene. B 793,470, Cl. 260-673.000.

Kaes, Richard W. Fish manure removal method. B 818,946, Cl. 210-67.000.

Kageyama, Minoru: *See*—
Hayashi, Torahiko; Kageyama, Minoru; and Morikawa, Michio, B 665,326, Cl. 264-173.000.

Kagiyama, Yasuo; and Miyazaki, Nobumasa, to Daihatsu Diesel Manufacturing Co., Ltd. Temperature controlled valve assembly. B 793,359, Cl. 236-12.00A.

Kai, Fumio; Saito, Toshinori; Seki, Shigeo; and Kawasaki, Toyoaki, to Meiji Seika Kaisha, Ltd. Cephalosporin-type antibiotics and process for producing the same. B 588,555, Cl. 544-27.000.

Kaimori, Kenichiro: *See*—
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, B 798,313, Cl. 274-15.00R.

Kaiser Aluminum & Chemical Corporation: *See*—
Bell, Norman; Andersen, John N.; and Lam, Hung-Kei H., B 855,506, Cl. 423-119.000.
Dorsey, Geoffrey A., Jr., B 714,157, Cl. 148-6.270.

Kaiser, George E.: *See*—
Williams, Douglas W.; and Kaiser, George E., B 750,918, Cl. 180-51.000.

Kaiser Steel Corporation: *See*—
Collin, Alvaro L.; and Patel, Gordhan M., 4,112,693, Cl. 405-132.000.

Kajima Kensetsu Kabushiki Kaisha: *See*—
Hosoya, Kazuo; and Kubota, Munetaka, 4,112,690, Cl. 405-57.000.

Kajiura, Masaru: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.

Kakinuma, Toshihide; Kume, Toshiaki; Takenoya, Hideaki; Makabe, Hachiro; and Watanabe, Kazuo, to Janome Sewing Machine Co., Ltd. Sewing machine with a pattern generating device. 4,112,858, Cl. 112-158.00E.

Kakizaki, Yukio, to Nippon Kogaku K. K. Cross-movable carriage. B 768,608, Cl. 248-430.000.

Kalchgruber, Gerhard: *See*—
Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, B 808,767, Cl. 260-448.20E.

Kalnin, Ilmar L.; and Breckenridge, George J., to Celanese Corporation. Production of high temperature resistant polymer compositions capable of forming superior fiber reinforced composite articles. B 759,927, Cl. 260-857.0TW.

Kalnin, Robert Karlovich: *See*—
Ryzhov, Vladimir Dmitrievich; Litvinenko, Semen Kirillovich; Leikin, Roman Samuilovich; Kulberg, Anton Yanovich; Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich, B 704,693, Cl. 221-171.000.

Kaluzhsky, Nikolai Andreevich: *See*—
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, B 702,208, Cl. 423-131.000.

Kamano, Yoshiaki; Michishita, Kazuhiko; Seki, Teruya; and Tanaka, Ichiro, to Taisho Pharmaceutical Co., Ltd. Method for preparing 17 α-ester-21-halo pregnanes. B 671,693, Cl. 260-397.450.

Kamata, Akira: *See*—
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, B 780,843, Cl. 195-68.000.

Kamimura, Yoshiharu: *See*—
Sakurai, Toshio; Shimada, Shoji; and Kamimura, Yoshiharu, B 710,312, Cl. 252-49.600.

Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, to Fujisawa Pharmaceutical Co., Ltd. 7-Amino 2-lower alkyl-2 or 3-chephem-4-carboxylic acid derivatives and processes for preparation thereof. B 640,910, Cl. 544-16.000.

Kanbe, Masaru: *See*—
Kogure, Motoo; Komiya, Mamoru; Oishi, Masaharu; and Kanbe, Masaru, B 677,266, Cl. 428-412.000.

Kandanian, Aram Y.: *See*—
Cotten, Roger C.; Young, David W.; and Kandanian, Aram Y., B 851,764, Cl. 260-897.00A.

Kandler, Joachim: *See*—
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; Auel, Theodor; and Kloss, Werner, B 815,160, Cl. 423-265.000.

Kaneko, Moriwo, to Kabushiki Kaisha Saginomiya Seisakusho. Pilot valve-type evaporating pressure-regulating valve used in refrigerators. 4,112,704, Cl. 62-217.000.

Kaneko, Noboru, to Kabushiki Kaisha Daini Seikosha. Digital electronic timepiece. 4,112,669, Cl. 58-4.00A.

Kaneko, Yasunori: *See*—
Maki, Masao; Kaneko, Yasunori; Tsuruda, Kunihiro; and Kobayashi, Ikuo, B 846,495, Cl. 423-239.000.

Kaneko, Yutaka: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, B 814,121, Cl. 96-60.00R.

Kang, Pierson S., to ChemPar Corporation. Method of making cutting, scoring and embossing die set. 4,112,827, Cl. 93-58.300.

Kankaanpaa, Matti, to Valmet Oy. Paper machine with twin-wire former. B 787,321, Cl. 162-272.000.

Kankaanpaa, Matti, to Valmet Oy. Paper manufacturing structure particularly for detaching a web from a wire. B 787,334, Cl. 162-301.000.

Kano, Masafumi: *See*—
Tugukuni, Hideyoshi; and Kano, Masafumi, B 683,508, Cl. 428-407.000.

Kantner, Edward, to Exxon Research & Engineering Co. Zinc-halogen compound electrochemical cell having an auxiliary electrode and method. B 800,786, Cl. 429-50.000.

Kanzaki, Hisao: *See*—
Nojiri, Shoji; Kanzaki, Hisao; Yasoshima, Nobuyuki; Satake, Yasuo; and Ogawa, Kenichi, B 788,971, Cl. 179-84.00R.

Kapanka, Harley L., to General Motors Corporation. Headrest for vehicles. B 862,954, Cl. 297-408.000.

Kaplan, Jay: *See*—
Schulman, Jerome L.; and Kaplan, Jay, 4,112,926, Cl. 128-2.00S.

Karlin, James Hilliard: *See*—
Derdzinski, Terrence Edmund; and Karlin, James Hilliard, B 620,987, Cl. 312-198.000.

Karliner, Rudolf R.: *See*—
Brown, Robert M.; and Karliner, Rudolf R., B 723,465, Cl. 222-324.000.

Karnaugh, Maurice, to International Business Machines Corporation. Modular switching system. B 796,296, Cl. 340-166.00R.

Kasai, Kazumi, to Yoshida Kogyo K.K. Separable slide fastener with an automatically locking slider. 4,112,554, Cl. 24-205.11R.

Kasmarik, Joseph R., to Avco Corporation. Thrust spoiler for turbofan engine. 4,112,677, Cl. 60-226.00R.

Kasparek, Karel: *See*—
Chrtek, Milan; Gabler, Josef; Tuma, Frantisek; Kasparek, Karel; and Blasko, Jan, 4,112,663, Cl. 57-58.890.

Katano, Takeshi: *See*—
Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, B 626,098, Cl. 325-320.000.

Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Rotary burner. B 771,665, Cl. 431-1.000.

Katayama, Susumu: *See*—
Inoue, Hiromitsu; Ohashi, Hiroshi; and Katayama, Susumu, B 719,159, Cl. 340-558.000.

Kato, Hisao; and Sakamoto, Yohei. Apparatus for collecting shellfish and the like. 4,112,602, Cl. 37-55.000.

Kato, Yoshiaki; and Motoki, Jinro, to Citizen Watch Co., Ltd. Pulse motor driving system for use in a timepiece. 4,112,671, Cl. 58-23.00D.

Katz, George, to RCA Corporation. Method of assembling components on printed circuit boards. B 771,679, Cl. 148-23.000.

Katz, Lewis Emanuel; and Paulnack, Carl Lewis, to Bell Telephone Laboratories, Incorporated. Formation of epitaxial layers on substrate wafers utilizing an inert heat radiation ring to promote uniform heating. B 853,126, Cl. 156-612.000.

Katz, Saul Norman, to General Foods Corporation. Membrane decaffeination. B 837,349, Cl. 426-422.000.

Kauffman, Robert N.: *See*—
Smith, James D. B.; and Kauffman, Robert N., B 773,875, Cl. 260-830.0TW.

Kauffman, William J., to Armstrong Cork Company. Novel catalyst system for trimerization of organic isocyanates. B 812,342, Cl. 544-67.000.

Kaufman, Aleksander Arkadi, to Scintrex Limited. Inductive source method of induced polarization prospecting. B 774,780, Cl. 324-1.000.

Kaufmann, Helmut: *See*—
Helfgen, Werner; Lindner, Gerhard; Lingens, Paul; and Kaufmann, Helmut, B 702,593, Cl. 264-3.00R.

Kaveloski, Robert J. Prefabricated disposable fly trap blank. 4,112,609, Cl. 43-118.000.

Kawabe, Takamasa; Kadoma, Masaaki; Murakami, Kazuyoshi; and Itoh, Hatuhide, to Osaka Soda Co., Ltd. Process for continuous production of epichlorohydrin. B 748,473, Cl. 260-348.220.

Kawada, Hiroitsu: *See—*
Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, B 686,154, Cl. 424-317.000.

Kawaguchi, Kazumasa: *See—*
Tokimoto, Tadashi; Kawaguchi, Kazumasa; Izawa, Junji; and Hiraishi, Yoshinobu, B 733,400, Cl. 423-336.000.

Kawahara, Shigemi: *See—*
Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, B 686,154, Cl. 424-317.000.

Kawakami, Isao: *See—*
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, B 780,843, Cl. 195-68.000.

Kawamura, Hiroaki: *See—*
Tsutsui, Nobuyuki; Inui, Tsuneo; and Kawamura, Hiroaki, B 818,099, Cl. 204-37.00T.

Kawamura, Yuzo. Method for manufacturing composition including fine particles dispersed therein. B 688,639, Cl. 264-101.000.

Kawasaki Kasei Chemicals Ltd.: *See—*
Matsuura, Ryo; Nakatani, Shuichi; Nagaoka, Kazuya; and Hioki, Katsuhiko, B 818,761, Cl. 260-351.000.

Kawasaki, Kazuhiko: *See—*
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, B 798,313, Cl. 274-15.00R.

Kawasaki, Masahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Weak camera battery warning circuit. B 828,689, Cl. 354-289.000.

Kawasaki, Mikio: *See—*
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, B 814,121, Cl. 96-60.00R.

Kawasaki Steel Corporation: *See—*
Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, B 760,376, Cl. 148-113.000.

Kawasaki, Toyoaki: *See—*
Kai, Fumio; Saito, Toshinori; Seki, Shigeo; and Kawasaki, Toyoaki, B 588,555, Cl. 544-27.000.

Kay, Peter Dunlop, to Tioxide Group Limited. Titanium compounds. B 774,140, Cl. 260-429.500.

Kaya, Hisao: *See—*
Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, B 771,665, Cl. 431-1.000.

Kayabakogyokabushikikaisha: *See—*
Murata, Hikaru, 4,112,822, Cl. 91-29.000.
Murata, Hikaru, 4,112,825, Cl. 91-447.000.

Kayanuma, Kanji, to Victor Company of Japan, Limited. Closed loop laser noise elimination for optoelectronic recording. B 832,890, Cl. 358-128.000.

Kaye, Morton. Optical measurement system. B 678,059, Cl. 356-164.000.

Kaye, Morton. Opto-mechanical measuring system. 4,112,579, Cl. 33-174.00L.

Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, to Agency of Industrial Science and Technology. Apparatus for separating non-magnetic materials of different densities. B 720,502, Cl. 209-1.000.

Kazuhiro, Kizawa: *See—*
Juichi, Imamura; Masahiko, Takehara; and Kazuhiro, Kizawa, B 657,887, Cl. 260-600.00R.

Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, to Boehringer Ingelheim GmbH. 2- or 4-Hydroxy-3,5-dihalo-benzylamines and salts thereof. B 812,325, Cl. 260-570.900.

Keeney, Joseph G.: *See—*
Wild, Robert W.; and Keeney, Joseph G., 4,112,535, Cl. 15-98.000.

Keiner, Hildegard; Schmid, Emil; and Richly, Walter, to Licentia Patent-Verwaltungs-G.m.b.H. Method of manufacturing an electrically conductive contact layer. B 742,688, Cl. 427-108.000.

Keiper K. G.: *See—*
Werner, Paul; Wirtz, Egon; and Lehmann, Gerhard, B 786,815, Cl. 297-362.000.

Keiper Trainingsysteme GmbH & Co.: *See—*
Putsch, Peter Ulrich, 4,112,928, Cl. 128-2.05R.

Kemper, Yves Jean; and Bigot, Lucien, to Vadetec Corporation. Variable speed transmission device. 4,112,779, Cl. 74-191.000.

Kemper, Yves Jean; and Bigot, Lucien, to Vadetec Corporation. Variable speed transmission device. 4,112,780, Cl. 74-191.000.

Kendall, John Edward; and Butwell, Kenneth Francis, to Union Carbide Corporation. Process for separating polymeric contaminants from aqueous absorbent solutions used to treat organic gas-containing gas streams. B 836,542, Cl. 423-226.000.

Kendall, Larry J., to Fairchild Camera and Instrument Corporation. Current comparator for an improved analog-to-digital converter method and apparatus. B 706,668, Cl. 340-347.0AD.

Kenji, Usui: *See—*
Shogo, Iizuka; Mitsuo, Endo; Mitsugu, Watanabe; Toshio, Iizuka; and Kenji, Usui, B 737,025, Cl. 219-56.000.

Kenkare, Divaker B.; and Shumway, Durland K., to Colgate-Palmolive Company. Antiperspirant composition. B 557,561, Cl. 424-46.000.

Kenkare, Divaker B.: *See—*
Carson, John C., Jr.; Robbins, Clarence R.; and Kenkare, Divaker B., 4,112,536, Cl. 15-104.940.

Kennecott Copper Corporation: *See—*
Cook, Glenn; and Larson, Paul, B 845,128, Cl. 204-105.00R.
Smith, Richard D., B 769,723, Cl. 75-159.000.

Kennedy, Harold, Jr., to United States Pipe and Foundry Company. Hanger for pipe. B 856,384, Cl. 285-61.000.

Kennedy, John Hamilton: *See—*
Duff, Ian David; Kennedy, John Hamilton; and Bunce, Roger Abraham, B 712,164, Cl. 422-63.000.

KeNova AB: *See—*
Nilson, Billy N., 4,112,971, Cl. 137-508.000.

Kent, Harry James: *See—*
Pietrusza, Arthur Jacob; and Kent, Harry James, B 709,427, Cl. 435-222.000.

Kerfoot, William B.; and Brainard, Edward C., II, to Environmental Devices Corporation. Scanning apparatus for septic effluents. 4,112,741, Cl. 73-53.000.

Kernell, Samuel H. Twirling toy device. 4,112,611, Cl. 46-47.000.

Kessler, Gerald. D.I.G. Foam spacer. B 757,291, Cl. 428-34.000.

Ketterer, Richard J. Device for cleaning and revitalizing wound strings for musical instruments. 4,112,808, Cl. 84-453.000.

Keuffel & Esser Company: *See—*
Kooi, J. Peter E.; and Vagyoczky, Stephen, 4,112,584, Cl. 33-292.000.

Khare, Gyaneshwar Prasad. Radioimmunoassay of hormones and metabolites in blood serum and plasma. B 640,841, Cl. 23-230.600.

Kibler, Roland G., to General Motors Corporation. Engine speed governor. 4,112,886, Cl. 123-103.00R.

Kidde Consumer Durables Corp.: *See—*
Belinkoff, Irving R., B 790,509, Cl. 241-37.500.

Kiefer, Udo; von Loeben, Wolf; and Schulz, Friedrich Wilhelm, to Siemens Aktiengesellschaft. Apparatus for measuring caster and camber in motor vehicles. B 783,407, Cl. 356-155.000.

Kiefer, Werner, to Jenaer Glaswerk Schott & Gen. Fire resistant windows. B 637,424, Cl. 428-34.000.

Kierstead, Richard Wightman: *See—*
Cohen, Michael Robert; Kierstead, Richard Wightman; and Tilley, Jefferson Wright, B 844,570, Cl. 260-565.000.

Kiess, Ulrich: *See—*
Kohler, Werner; Drucker, Gerhard; Kiess, Ulrich; and Stotz, Manfred, B 717,682, Cl. 429-78.000.

Kikuchi, Shoji: *See—*
Deguchi, Hidetaka; Kikuchi, Shoji; Wada, Hajime; Satoh, Shui; and Endo, Takaya, B 656,084, Cl. 96-66.00R.

Kikuchi, Tatsuo: *See—*
Tokumoto, Shin-Ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, B 801,640, Cl. 204-39.000.
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, B 802,487, Cl. 204-39.000.

Kimball International, Inc.: *See—*
Robinson, John William; Crosby, Thomas C.; and Howell, Stephen Louis, 4,112,802, Cl. 84-1.010.

Kimura, Akio: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, B 768,875, Cl. 424-225.000.

Kimura, Katsuhiko; and Nishikawa, Masaji, to Olympus Optical Co., Ltd. Photosensitive screen drum for electrographic apparatuses. B 752,839, Cl. 355-3.0SC.

Kimura, Shin: *See—*
Terasawa, Yoshio; and Kimura, Shin, B 652,662, Cl. 357-38.000.

King, Charles A.; and Gutterman, Robert P., to General Kinetics, Incorporated. Magnetic can sorter. B 716,285, Cl. 209-609.000.

King, John Olmsted. Self-dimpling fastener pin. 4,112,811, Cl. 85-7.000.

King, William Clifton, to Bell Telephone Laboratories, Incorporated. Optically coupled device with diffusely reflecting enclosure. B 573,401, Cl. 357-19.000.

Kirchmayr, Rudolf: *See—*
Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, B 806,044, Cl. 521-108.000.

Kirsch, Bernhard. Ski binding automatically releasable by overstress. B 756,469, Cl. 280-616.000.

Kirsch, Norbert, to General Motors Corporation. Bumpers on motor vehicles. B 776,202, Cl. 293-96.000.

Kirschner, Helmut: *See—*
Huber, Leonhard; Kirschner, Helmut; and Muller, Herbert, B 763,684, Cl. 354-252.000.

Kitamura, Masanao: *See—*
Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, B 771,665, Cl. 431-1.000.

Kitrell, John V. Safety reflector device for bicycles or the like. B 730,695, Cl. 350-99.000.

Kitzig, Werner: *See—*
Kocher, Heinz; Kitzig, Werner; and Witteveen, Piet Jozef, B 566,178, Cl. 244-3.110.

Kiuchi, Mitsuyuki; Amagami, Keizo; Maeda, Shigeru; and Saegusa, Shigeharu, to Matsushita Electric Industrial Co., Ltd.; and Kyokuto Electric Company, Limited. Switching and heat control mechanism for induction heating cooking apparatus having a plurality of work coils. B 764,983, Cl. 219-10.49R.

Kiuru, Erkki Sakari: *See*—
Leinonen, Erkki Ilmari; and Kiuru, Erkki Sakari, B 735,983, Cl. 323-17.000.

Klaasen, Dirk, to Stamicarbon, B.V. Apparatus for producing polymers having a wide molecular weight distribution. B 709,080, Cl. 422-132.000.

Klaiik, Otto, to Licentia Patent-Verwaltungs-G.m.b.H. Rapid tuning circuit for high frequency receivers. B 814,103, Cl. 325-453.000.

Kleiman, Moisha Gershovich: *See*—
Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich, 4,112,702, Cl. 62-123.000.

Klein, Donald J.: *See*—
Bowker, Donald R.; Klein, Donald J.; and Rados, Stephen E., B 656,538, Cl. 264-295.000.

Klein, Gerhart P., to P. R. Mallory & Co. Inc. Continuous open-ended sintering furnace system. B 769,369, Cl. 266-252.000.

Klein, Yitzhak: *See*—
Goldstein, Jonathan R.; and Klein, Yitzhak, B 812,672, Cl. 429-27.000.

Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, to Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Process for the production of benzoyl cyanide (I). B 802,946, Cl. 260-545.00R.

Kley, Victor B. Potentiometer. B 719,407, Cl. 338-231.000.

Klie, Jurgen, to G. Duesterloh GmbH. Control arrangement for a hydrostatic axial or radial piston machine. 4,112,973, Cl. 137-625.210.

Klinger AG: *See*—
Kruschik, Julius, 4,112,965, Cl. 137-219.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Hoppen, Heinz; and Fasbender, Heinz, B 787,598, Cl. 241-24.000.
Tholen, Paul, 4,112,684, Cl. 60-606.000.

Kloss, Werner: *See*—
Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; Auel, Theodor; and Kloss, Werner, B 815,160, Cl. 423-265.000.

Klug, Helmut: *See*—
Frey, Hans-Helmut; and Klug, Helmut, B 849,161, Cl. 260-897.00C.

Knapp, Heinrich: *See*—
Schwartz, Reinhard; Knapp, Heinrich; Riel, Klaus; and Peters, Klaus-Jurgen, 4,112,900, Cl. 123-139.0AW.

Knepler, John T., to Dickey-john Corporation. Air pressure monitor. 4,112,777, Cl. 73-728.000.

Kobayashi, Akira: *See*—
Sano, Takezo; Kobayashi, Akira; and Inoue, Haruo, B 699,255, Cl. 521-29.000.

Kobayashi, Hidehiko: *See*—
Shiga, Tetsuo; Ozaki, Masaru; Arakawa, Tatsumi; and Kobayashi, Hidehiko, B 751,778, Cl. 96-114.100.

Kobayashi, Ikuo: *See*—
Maki, Masao; Kaneko, Yasunori; Tsuruda, Kunihiro; and Kobayashi, Ikuo, B 846,495, Cl. 423-239.000.

Kobayashi, Shigeru: *See*—
Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, B 760,376, Cl. 148-113.000.

Kobe, Inc.: *See*—
Brown, Francis Barton; and Erickson, John W., B 768,581, Cl. 55-203.000.

Kobe Steel, Ltd.: *See*—
Asari, Akira; and Tsuzuki, Hidehiro, 4,112,723, Cl. 72-60.000.

Kober, Alfred E.: *See*—
Bennett, Robert P.; and Kober, Alfred E., B 792,939, Cl. 55-5.000.

Kobosh, Harry J. Portable seat for hunters. B 564,744, Cl. 182-187.000.

Koch, Hans W., to Roller Bearing Company of America. Combination seal and thrust washer for anti-friction bearings. B 755,445, Cl. 308-187.100.

Koch, Karlheinz; and Breitzke, Willi, to Henkel Kommanditgesellschaft auf Aktien. High viscosity neutral polyester lubricants. B 741,160, Cl. 252-56.00S.

Koch, Robert L., II, to George Koch Sons, Inc. Radiation curable coating process. B 731,755, Cl. 427-44.000.

Kocher, Heinz; Kitzig, Werner; and Witteveen, Piet Jozef, to Bolkow Gesellschaft mit beschrankter Haftung. Method and apparatus for thrust vector control of spin stabilized flying bodies by means of a single jet rudder. B 566,178, Cl. 244-3.110.

Koether, Bernard G.; and Shaughnessy, William J., to Food Automation-Service Techniques, Inc. Filter apparatus. B 790,429, Cl. 210-167.000.

Kogure, Motoo; Komiya, Mamoru; Oishi, Masaharu; and Kanbe, Masaru, to Konishiroku Photo Industry Co., Ltd. Undercoat-applied plastic films. B 677,266, Cl. 428-412.000.

Kohler, Werner; Drucker, Gerhard; Kiess, Ulrich; and Stotz, Manfred, to Daimler-Benz Aktiengesellschaft. Battery filling and venting structure. B 717,682, Cl. 429-78.000.

Kohlhepp, Dean H.: *See*—
Marsh, Paul G.; and Kohlhepp, Dean H., B 804,786, Cl. 241-21.000.

Kohlstette, Werner: *See*—
Pautsch, Gunthard; and Kohlstette, Werner, B 811,421, Cl. 233-11.000.

Koike, Hiroshi; Suzuki, Shoji; and Asakawa, Takeki. Automatic diaphragm assembly. B 778,240, Cl. 350-269.000.

Koike, Sakae; Matsunami, Shoichi; Goto, Yorinobu; and Tanabe, Yoshio, to Mitsubishi Chemical Industries, Ltd. Method of treating combustion exhaust gas containing nitrogen oxides. B 755,936, Cl. 423-235.000.

Kojima, Katsuhiro: *See*—
Watanabe, Kazuo; Endo, Toshio; and Kojima, Katsuhiro, 4,112,626, Cl. 51-35.000.

Kojimoto, Susumu; Sato, Takami; and Mori, Toshio, to Sumitomo Chemical Company, Limited. Method for producing special pipes having longitudinally extending diaphragm partitions. B 723,977, Cl. 264-89.000.

Koketsu, Sotoichi. Spectacles' frame with vertically adjustable nose pads. B 688,480, Cl. 351-128.000.

Kolb, Dieter: *See*—
Ford, Michael Alan; Mould, Henry Manifold; and Kolb, Dieter, B 757,204, Cl. 356-96.000.

Kolb, Gunter: *See*—
Sackmann, Gunter; Hendricks, Udo-Winfried; Honig, Hans-Ludwig; Kolb, Gunter; and Muller, Friedhelm, B 749,455, Cl. 106-238.000.

Kolk, Erich: *See*—
Schweier, Gunther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, B 762,858, Cl. 526-124.000.

Kollar, Ernest Paul: *See*—
Colglazier, Donald Francis; Fallon, John Leslie; Kollar, Ernest Paul; and Mares, Fred Ralph, B 788,570, Cl. 271-10.000.

Koller, Stefan: *See*—
Loew, Peter; and Koller, Stefan, B 676,599, Cl. 260-147.000.

Kolling, Georg: *See*—
Kroger, Carl; Romey, Ingo; and Kolling, Georg, B 649,920, Cl. 264-120.000.

Kolyshenko, Mikhail Vasilievich: *See*—
Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich, B 679,437, Cl. 169-12.000.

Komatsu Electronci Metals, Co., Ltd.: *See*—
Tokimoto, Tadashi; Kawaguchi, Kazumasa; Izawa, Junji; and Hiraishi, Yoshinobu, B 733,400, Cl. 423-336.000.

Komatsu, Saburo, to O.P.O. Giken Kabushiki Kaisha. Plunger type solenoid. B 715,193, Cl. 335-258.000.

Komatsu, Toshio: *See*—
Yoshikawa, Yoshio; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, B 751,668, Cl. 252-428.000.

Komiya, Mamoru: *See*—
Kogure, Motoo; Komiya, Mamoru; Oishi, Masaharu; and Kanbe, Masaru, B 677,266, Cl. 428-412.000.

Komiyama, Yoshiro; Kondo, Katsumi; Koyama, Mototsugu; Nagaoka, Masaaki; and Uchida, Tsuneo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust system means for automobiles. B 781,408, Cl. 228-176.000.

Kondo, Katsumi: *See*—
Komiyama, Yoshiro; Kondo, Katsumi; Koyama, Mototsugu; Nagaoka, Masaaki; and Uchida, Tsuneo, B 781,408, Cl. 228-176.000.

Kondo, Yoshikazu: *See*—
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; and Suzuki, Shosuke, B 730,115, Cl. 181-284.000.

Konig, Horst: *See*—
Gudenau, H. W.; Konig, Horst; Rath, Gero; and Roth, Haye, B 771,748, Cl. 75-12.000.

Konishi, Hiroyuki: *See*—
Oshio, Hiromichi; Konishi, Hiroyuki; Matsumura, Shiunzi; Ishikawa, Kikuichi; and Yoneyama, Eiichi, B 776,618, Cl. 71-76.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Deguchi, Hidetaka; Kikuchi, Shoji; Wada, Hajime; Satoh, Shui; and Endo, Takaya, B 656,084, Cl. 96-66.00R.
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, B 814,121, Cl. 96-60.00R.
Kogure, Motoo; Komiya, Mamoru; Oishi, Masaharu; and Kanbe, Masaru, B 677,266, Cl. 428-412.000.

Kono, Tateomi: *See*—
Nakamura, Yoshihiro; Shibazaki, Kenji; Kono, Tateomi; Inagaki, Syotaro; and Murata, Tomoji, B 736,189, Cl. 355-14.000.

Kontekla Oy.: *See*—
Ebeling, Martti Olavi Aladar; and Lunden, Risto Waldemar, 4,112,691, Cl. 405-119.000.

Kooi, Else; and vanLierop, Joseph Gijsbertus, to U.S. Philips Corporation. Semiconductor manufacturing method using buried nitride formed by a nitridation treatment in the presence of active nitrogen. B 671,419, Cl. 148-1.500.

Kooi, J. Peter E.; and Vagyoczky, Stephen, to Keuffel & Esser Company. Telescope level adjusting means. 4,112,584, Cl. 33-292.000.

Kopp, Valentine T., to Merrill Brothers. Lifting clamp and spring therefor. B 710,736, Cl. 294-104.000.

Koppehele, Frithjof: *See*—
Bauch, Helmut; Mohrmann, Karl Heinz; and Koppehele, Frithjof, B 795,706, Cl. 330-56.000.

Koppl, Franz: *See*—
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, B 737,249, Cl. 148-174.000.

Koranda, Clarence J. Railway hopper car labyrinth gate seal. 4,112,852, Cl. 105-282.00A.

Korbuly, Jozsef: *See*—
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef;

Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.

Kores S.p.A.: *See—*
Muthenthaller, Gustav, B 823,963, Cl. 227-124.000.

Kornis, Gabriel: *See—*
Moon, Malcolm W.; and Kornis, Gabriel, B 846,158, Cl. 548-374.000.
Moon, Malcolm W.; and Kornis, Gabriel, B 846,159, Cl. 548-374.000.

Korosue, Akira. Variable speed power transmission. 4,112,778, Cl. 74-117.000.

Koseki, Yasuo; Takahashi, Sankichi; and Nakaoka, Azuma, to Hitachi, Ltd. Method of and apparatus for solid-liquid separation. B 748,762, Cl. 210-82.000.

Koslowski, Gerhard: *See—*
Schippers, Heinz; Hensen, Friedhelm; Koslowski, Gerhard; and Czerwon, Dieter, B 722,558, Cl. 526-351.000.

Kosolapova, Antonina Pavlovna: *See—*
Mirsky, Yakov Volfovich; Dorogochinsky, Akivy Zinovievich; Meged, Nelli Fillipovna; and Kosolapova, Antonina Pavlovna, B 710,651, Cl. 423-329.000.

Kostin, Vladimir Nikolaevich: *See—*
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, B 702,208, Cl. 423-131.000.

Kotelnikov, Grigory Vladimirovich: *See—*
Goryachev, Vladimir Ilich; Kotelnikov, Grigory Vladimirovich; and Makurin, Pavel Semenovich, 4,112,734, Cl. 73-15.00B.

Kountz, Kenneth John, to Borg-Warner Corporation. Refrigeration control system. 4,112,703, Cl. 62-211.000.

Koutroulos, Jean: *See—*
Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Koutroulos, Jean, B 768,494, Cl. 96-1.0PC.

Kowitz, Friedrich: *See—*
Bischoff, Jurgen; Kowitz, Friedrich; Ott, Karl-Heinz; Schuster, Herbert; Rohr, Harry; and Weitzel, Hans, B 400,980, Cl. 260-876.00R.

Koyama, Mitsuo: *See—*
Onda, Eiichi; Watanabe, Masanori; Nakagawa, Tadashi; Nemoto, Ichiro; and Koyama, Mitsuo, B 766,745, Cl. 354-249.000.

Koyama, Mototsugu: *See—*
Komiyama, Yoshiro; Kondo, Katsumi; Koyama, Mototsugu; Nagaoka, Masaaki; and Uchida, Tsuneo, B 781,408, Cl. 228-176.000.

Koyo Seiko Company Limited: *See—*
Okuda, Hiroji; and Harada, Shigenori, 4,112,710, Cl. 64-23.000.

Kozljuk, Anatoly Ivanovich: *See—*
Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich, B 679,437, Cl. 169-12.000.

Kozlov, Viktor Mikhailovich: *See—*
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, B 702,208, Cl. 423-131.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Rohr, Karl, B 742,195, Cl. 308-9.000.

Kramer, Franklin; Henig, Yair Steve; Garin, Torunn Atteraas; and Vogel, Gerald James, to General Foods Corporation. Adsorption process. B 771,485, Cl. 426-422.000.

Kramer, John B., to Allied Chemical Corporation. Pressurizing fuel ram air charger. 4,112,899, Cl. 123-139.0AW.

Kramer, Vance M., Jr.: *See—*
Kramer, Vance M., Sr.; and Kramer, Vance M., Jr., B 823,837, Cl. 264-294.000.

Kramer, Vance M., Sr.; and Kramer, Vance M., Jr. Method for making flexible corrugated rubber tubing and tubing produced thereby. B 823,837, Cl. 264-294.000.

Krasovec, Branko; Mihelic, Eli; and Reutlinger, Suzana, to HP Kolinska Ljubljana Prehrambena Indsutrija (n.sol.o.). Process for the preparation of a concentrate from waste chicken-broth and product therefrom. B 778,319, Cl. 426-56.000.

Krause, Alois, to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung. Double-hydraulic actuator. 4,112,824, Cl. 91-413.000.

Krauss, Guenter, to Siemens Aktiengesellschaft. Electromechanical filter having encapsulated input and terminal circuit capacitors. B 741,848, Cl. 333-71.000.

Krawza, Walter G.: *See—*
Savanick, George A.; and Krawza, Walter G., B 809,881, Cl. 299-4.000.

Krehl, William H.: *See—*
DeHart, John R.; Nelson, Larry L.; and Krehl, William H., B 775,386, Cl. 209-549.000.

Kreiger, John W., to Bethlehem Steel Corporation. Green balls formed by agglomerating wet-collected fume produced in metallurgical furnaces. B 734,771, Cl. 75-256.000.

Kreuzburg, Gerhard; Lenz, Arnold; and Rogler, Walter, to Dynamit Nobel Aktiengesellschaft. Method of preparing orthosilicic acid alkyl esters. B 706,864, Cl. 260-448.80A.

Krippelz, Jacob. Method of cushioning and ventilating a foot, and footwear including disposable slippers and insoles for practicing such method. 4,112,599, Cl. 36-11.500.

Kroger, Carl; Romey, Ingo; and Kolling, Georg, to Bergwerksverband GmbH. Coal-containing shaped bodies and process for making the same. B 649,920, Cl. 264-120.000.

Krogmann, Uwe Jonny: *See—*
Fuhrman, Gunther Georg; Krogmann, Uwe Jonny; and Schroth, Gerhard Wolfgang, 4,112,856, Cl. 110-165.00R.

Krohn, W. Henrik: *See—*
Lefkowitz, Leonard R.; and Krohn, W. Henrik, B 832,316, Cl. 156-148.000.

Kronfeld, Mervin B., to Nortronics Company, Inc. Dispenser package for magnetic tape splicing tabs. B 734,363, Cl. 221-70.000.

Krude, Werner, to Uni-Cardan AG. Double universal joint. 4,112,709, Cl. 64-21.000.

Kruger, Gerd: *See—*
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, B 812,325, Cl. 260-570.900.

Kruger, Hans, to Schering AG. Process for making 5-amino-1,2,3-thiadiazoles. B 823,526, Cl. 260-306.80D.

Kruschik, Julius, to Klinger AG. Shutoff element. 4,112,965, Cl. 137-219.000.

Kruse, Hubert; and Opitz, Konrad, to Hoechst Aktiengesellschaft. Preparation of a disperse dyestuff containing a phosphoric acid ester, having improved safety properties and higher dyestuff yield when dyed on synthetic materials. B 690,023, Cl. 8-90.000.

Krutov, Sergei Vasilievich: *See—*
Glushkov, Alexandr Ivanovich; Krutov, Sergei Vasilievich; Semenov, Vladimir Ivanovich; and Gusev, Anatoly Fedorovich, 4,112,547, Cl. 17-57.000.

Kubens, Rolf; and Gebauer, Herbert, to Bayer Aktiengesellschaft. Process for reinforcing geological formations. B 796,935, Cl. 166-295.000.

Kubina, John, to Engineered Systems, Inc. Verification checking system. B 789,960, Cl. 340-149.00A.

Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, to Nippon Telegraph and Telephone Public Corp.; and Matsushita Electric Industrial Co., Ltd. Frequency shift signal receiver. B 626,098, Cl. 325-320.000.

Kubota, Ltd.: *See—*
Fukuta, Shigemi; Izaki, Hiroshi; and Yoshino, Shoichi, B 712,068, Cl. 164-286.000.
Ozaki, Tsutomu; and Hijikata, Setsuo, B 712,952, Cl. 177-25.000.

Kubota, Masayoshi: *See—*
Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, B 720,502, Cl. 209-1.000.

Kubota, Munetaka: *See—*
Hosoya, Kazuo; and Kubota, Munetaka, 4,112,690, Cl. 405-57.000.

Kubotera, Haruo: *See—*
Nakaoka, Kazuhide; Araki, Kenzi; Nishimoto, Akihiko; Iwase, Kozi; and Kubotera, Haruo, B 713,793, Cl. 148-2.000.

Kucharski, Lawrence, Jr.: *See—*
DeRouen, Joseph Rodolph; and Kucharski, Lawrence, Jr., B 800,600, Cl. 338-174.000.

Kuhle, Engelbert: *See—*
Siegle, Peter; Kuhle, Engelbert; Hammann, Ingeborg; Homeyer, Bernhard; and Behrenz, Wolfgang, B 592,860, Cl. 424-278.000.

Kuhlein, Klaus: *See—*
Linkies, Adolf; Reuschling, Dieter-Bernd; Kuhlein, Klaus; Beck, Gerhard; and Musil, Josef, B 751,173, Cl. 424-274.000.

Kuhlmann, Wolf; and Rumpp, Gerhard, to Hilti Aktiengesellschaft. Expansion anchor assembly including a yielding member. 4,112,813, Cl. 85-74.000.

Kuhn, Hans Heinrich: *See—*
Hauser, Peter Jacob; and Kuhn, Hans Heinrich, B 815,122, Cl. 260-178.000.

Kuhnle, Hans-Frieder: *See—*
Stach, Kurt, deceased; Bosies, Elmar; Heerdt, Ruth; Kuhnle, Hans-Frieder; and Schmidt, Felix Helmut, B 674,993, Cl. 424-272.000.

Kuhnlein, Dieter: *See—*
Zeh, Werner; and Kuhnlein, Dieter, B 802,714, Cl. 360-92.000.

Kuitunen, Robert. Fuel system modification. 4,112,908, Cl. 123-198.00F.

Kukhno, Viktor Ivanovich: *See—*
Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich, B 679,437, Cl. 169-12.000.

Kulberg, Anton Yanovich: *See—*
Ryzhov, Vladimir Dmitrievich; Litvinenko, Semen Kirillovich; Leikin, Roman Samuilovich; Kulberg, Anton Yanovich; Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich, B 704,693, Cl. 221-171.000.

Kulish, Stanley J., Jr.: *See—*
Abair, Raymond L.; and Kulish, Stanley J., Jr., B 784,044, Cl. 261-81.000.

Kumamoto, Yoshito: *See—*
Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, B 771,665, Cl. 431-1.000.

Kumar, Atul: *See*—
Ledoux, Will A.; Schoen, William; and Kumar, Atul, B 738,494, Cl. 166-275.000.

Kume, Toshiaki: *See*—
Kakinuma, Toshihide; Kume, Toshiaki; Takenoya, Hideaki; Makabe, Hachiro; and Watanabe, Kazuo, 4,112,858, Cl. 112-158.00E.

Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, to BASF Aktiengesellschaft. Isolation and regeneration of rhodium-containing catalysts from distillation residues of hydroformylation reactions. B 780,297, Cl. 260-429.00R.

Kuno, Masaya: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.

Kurandt, Hans-Friedrich; and Schliephake, Dietrich, to Veba-Chemie Aktiengesellschaft. Process for preparing pure synthetic calcium sulfate semihydrate. B 740,469, Cl. 423-170.000.

Kuraray Co., Ltd.: *See*—
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, B 616,998, Cl. 560-124.000.

Kurata, Kenichi: *See*—
Matsunaga, Kazuo; Ishizawa, Hideo; and Kurata, Kenichi, B 735,523, Cl. 96-38.100.

Kurihara, Takao: *See*—
Uchida, Kuniki; Araki, Kenzi; Narita, Hirosi; Fukunaka, Shiro; and Kurihara, Takao, B 776,288, Cl. 148-12.300.

Kuriyama, Masao: *See*—
Terada, Yasuhiko; Yasuda, Jun; and Kuriyama, Masao, B 661,825, Cl. 8-120.000.

Kurkov, Victor P., to Chevron Research Company. Process for the production of N-acetyl-2-pyrrolidone. B 750,310, Cl. 260-326.5FL.

Kurtz, Leonard D.; and Bidwell, Robert E., to Deknatel, Inc. Surgical drainage system with pressure indicator and enclosed source of liquid. 4,112,948, Cl. 128-276.000.

Kurz, German: *See*—
von Linde, Robert; von Linde, Joachim; and Kurz, German, B 690,617, Cl. 431-352.000.

Kusunose, Takamaro: *See*—
Fukushima, Keitaro; Kusunose, Takamaro; and Nosaka, Yoshinori, B 719,504, Cl. 423-447.400.

Kuzma, Edward J.: *See*—
Patella, Ralph F.; and Kuzma, Edward J., B 856,829, Cl. 156-327.000.

Kyokuto Electric Company, Limited: *See*—
Kiuchi, Mitsuyuki; Amagami, Keizo; Maeda, Shigeru; and Saegusa, Shigeharu, B 764,983, Cl. 219-10.49R.

La Nationale S.A.: *See*—
Guenin, Andre, B 704,794, Cl. 431-124.000.

Labogiken Co., Ltd.: *See*—
Osanai, Shinichi, B 838,059, Cl. 242-1.000.

Laconte, Susana S.: *See*—
Gauron, Richard F.; and Laconte, Susana S., B 814,330, Cl. 292-165.000.

Lacour, Alain P.: *See*—
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., B 813,357, Cl. 544-360.000.

Laenen, Rene Johannes: *See*—
Einerhand, Johan Jozef; Erkens, Leonardus Johannes Hubertus; Laenen, Rene Johannes; and Hoofs, Joseph Wilhelmus Jacobus, B 809,336, Cl. 106-304.000.

LaFitte, Larry L.; and Camden, James B., to Buckeye Cellulose Corporation, The. Quiet, strong cloth-like tissue laminate. B 741,640, Cl. 428-284.000.

Lagow, Richard J.; Adcock, James L.; and Maraschin, Norma J., to Massachusetts Institute of Technology. Cryogenically controlled direct fluorination apparatus. B 379,876, Cl. 422-191.000.

Lagow, Richard J.; and Inoue, Shoji. Method for producing perfluoroether oligomers having terminal carboxylic acid groups. B 597,937, Cl. 562-583.000.

Lajeuness, John B. Waste water reclamation apparatus. 4,112,972, Cl. 137-597.000.

Lakhtjukhov, Valery Mikhailovich: *See*—
Vasiliev, Vladimir Sergeevich; Annenberg, Ernest Alexandrovich; Livshits, Abram Lazarevich; Polotsky, Vadim Evgenievich; and Lakhtjukhov, Valery Mikhailovich, B 780,357, Cl. 219-69.00W.

Lallinger, Georg, to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung. Warhead construction. 4,112,848, Cl. 102-69.000.

Lam, Hung-Kei H.: *See*—
Bell, Norman; Andersen, John N.; and Lam, Hung-Kei H., B 855,506, Cl. 423-119.000.

Lammert, Wayne F.; Simpson, Dayton M.; and Desai, Ardeshir R., to Brown & Root, Inc. Articulated stinger. 4,112,698, Cl. 405-167.000.

Lampert, Murray Alfred: *See*—
Pankove, Jacques Isaac; and Lampert, Murray Alfred, B 869,641, Cl. 148-1.500.

Lang, Gary E.: *See*—
Lang, Roger J.; and Lang, Gary E., B 736,309, Cl. 339-29.00R.

Lang, Karl: *See*—
Werder, Roger Daniel; Meier, Linus; and Lang, Karl, B 551,517, Cl. 422-65.000.

Lang, Roger. Solar-ray heating apparatus. 4,112,917, Cl. 126-270.000.

Lang, Roger J.; and Lang, Gary E., to Eltra Corporation. Re-formable multi-conductor flat cable. B 736,309, Cl. 339-29.00R.

Lang, Winfried: *See*—
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, B 737,249, Cl. 148-174.000.

Langdon, William Keith: *See*—
Helfert, Herbert; Davis, Pauls; and Langdon, William Keith, B 736,959, Cl. 260-615.00B.

Lange, Daniel J., to P. D. George Company, The. Aromatic imino acids and resins derived therefrom. B 823,732, Cl. 528-289.000.

Langhorst, Martin A.; Sinke, Gerard C.; and Mossner, Elmer H., to Dow Chemical Company, The. Extraction of non-ferrous metal values from dolomitic oxide ores. B 746,981, Cl. 75-101.00R.

Lanier Business Products, Inc.: *See*—
Bolick, Fred C., Jr.; and Titus IV, Theodore, B 719,423, Cl. 179-100.1DR.

Lantzsch, Reinhard, to Bayer Aktiengesellschaft. Preparation of 2,2-dimethyl-3-(2,2-dihalogenovinyl)-cyclopropane-1-carboxylic acid esters. B 795,588, Cl. 560-124.000.

Lappage, James; Doggett, Neil; and Yates, Stephen William, to Platt Saco Lowell Limited. Winding machines. 4,112,662, Cl. 57-34.0AT.

Laqua, Arnold; and Holtschmidt, Ulrich, to Th. Goldschmidt AG. Method for the preparation of hardenable urea formaldehyde resins. B 793,315, Cl. 260-29.40R.

Larcen, Donald W. Rotary burner control. B 804,689, Cl. 431-12.000.

Larimore, Frank C., to Minnesota Mining and Manufacturing Company. Electrode and magnetic connector assembly. 4,112,941, Cl. 128-2.06E.

Larock, Richard C., to Iowa State University Research Foundation. Synthesis of prostaglandin precursors. B 798,092, Cl. 260-429.00L.

Larson, John Arden; and Fischer, Robert Bowlby, to Ingersoll-Rand Company. Chrome steel casting. B 819,355, Cl. 148-36.000.

Larson, Paul: *See*—
Cook, Glenn; and Larson, Paul, B 845,128, Cl. 204-105.00R.

Lartigau, Guy: *See*—
Bost, Pierre-Etienne; and Lartigau, Guy, B 473,267, Cl. 260-592.000.

Lasag AG: *See*—
Von Allmen, Martin; and Schwob, Hans Peter, B 728,403, Cl. 219-121.0LM.

Latsch, Reinhard: *See*—
Assenheimer, Jurgen; Bianchi, Valerio; Brettschneider, Johannes; Latsch, Reinhard; and Scherenberg, Dieter, 4,112,879, Cl. 123-32.0EA.

Latypov, Anvar Latypovich; and Abrarov, Vakif Barievich. Apparatus for surgical treatment of scoliosis. 4,112,935, Cl. 128-69.000.

Lauer, James L.; and Peterkin, Melvin E., to Suntech, Inc. Viscosity measuring system. B 791,089, Cl. 356-70.000.

Laufer, Jay K.: *See*—
Watt, William R.; Astolfi, Edmund G.; and Laufer, Jay K., B 743,133, Cl. 427-44.000.

Laumann, Eugene A.: *See*—
United States of America, National Aeronautics and Space Administration; Laumann, Eugene A.; and Reynolds, Rollin K., 4,112,875, Cl. 123-1.00A.

Laundon, Brian; Cowley, Brian Richard; and Humber, David Cedric, to Glaxo Laboratories Limited. Preparation of cephalosporin compounds. B 749,300, Cl. 204-158.0HA.

Laviolette, Maurice A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Modular practice bomb. 4,112,843, Cl. 102-7.600.

Law, Gabriel H.; and Gysegem, Albert Peter, to Ameron, Inc. Coatings prepared from trialkoxysilanes. B 765,223, Cl. 260-37.0SB.

Lawler, James E.: *See*—
Fitzsimmons, William A.; and Lawler, James E., 4,112,580, Cl. 33-174.00S.

Lawrence, Jackson: *See*—
Troope, Walter S.; and Lawrence, Jackson, 4,112,559, Cl. 26-18.600.

Lawrence, Walter W., Jr.; McKay, Tom W.; and Wiegand, Karl E. Process for the purification of citric acid. B 807,738, Cl. 562-568.000.

Laws, Cecil Alfred: *See*—
Laws, Christopher Malcolm, B 772,646, Cl. 324-33.000.

Laws, Christopher Malcolm, to Laws, Cecil Alfred. Atmospheric ion density measurement. B 772,646, Cl. 324-33.000.

Lawton, William R. Curl-resistant adhesive-coated paper. B 769,703, Cl. 427-207.00R.

Lazenby, Webber W.; and Pulliam, Daniel N., to McDonnell Douglas Corporation. Joint for a nestable cargo carrier. B 820,930, Cl. 220-5.00A.

Leach, Harry Woods; Hebeda, Ronald Emil; and Holik, Dennis John, to CPC International Inc. Enzymatically produced maltose-maltotriose starch hydrolysate. B 721,926, Cl. 127-29.000.

Leach, Sam L. High intensity energy transfer technique. B 790,320, Cl. 204-157.10R.

Leason, Hayden L., to Filtertek, Inc. Process for making hermetically sealed filter units and filters made thereby. B 798,644, Cl. 210-446.000.

Lecce, Giovanni; and Andena, Paolo, to Leyan S.r.l. Camping tool, in particular for driving and extracting from the ground anchorage pegs of camping tents. 4,112,530, Cl. 7-146.000.

Leccese, Antonio: *See*—
Mayr, Adolfo; Davoli, Velmore; Leccese, Antonio; and Susa, Ermanno, B 733,709, Cl. 252-429.00C.

Lecolier, Serge L.; and Biehler, Jean-Marie J., to Societe Nationale des

Poudres et Explosifs. Carbamate-phosphonates as flame-proofing agents in polyurethane foam. B 838,460, Cl. 521-108.000.

Lednicer, Daniel, to Upjohn Company, The. Analgetic compounds, compositions and process of treatment. B 783,806, Cl. 424-248.560.

Ledoux, Will A.; Schoen, William; and Kumar, Atul, to Texaco Inc. Asphaltenes as sacrificial agents in oil recovery processes. B 738,494, Cl. 166-275.000.

Lee, Arthur L.; and Coval, Arthur B., to A. L. Lee Corporation. Interrelated controls for vehicle brakes, transmission and motor. B 702,396, Cl. 192-4.00A.

Lee, Cyril Arthur, to E M I Limited. Magnetic recording. B 622,753, Cl. 235-449.000.

Lee, Gim Fun, Jr., to General Electric. High impact polyphenylene ether resin compositions that include A-B-A block copolymers. B 527,142, Cl. 260-876.00B.

Lee, Gim Fun, Jr., to General Electric Company. Thermoplastic molding compositions of rubber modified copolymers of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride. B 671,569, Cl. 260-876.00B.

Lee, Haeng Yong. Three-way slide fastener. 4,112,552, Cl. 24-205.00R.

Lee, Joseph Y.: *See—*
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., B 850,194, Cl. 429-33.000.

Lee, Richard M.; and Szema, Li C., to Westinghouse Electric Corp. Cooling system for a gas turbine engine. B 742,739, Cl. 415-115.000.

Leek, Stanley, to Hawker Siddeley Dynamics Limited. Auxiliary control of vehicle direction. B 770,793, Cl. 244-3.210.

Lefkowitz, Leonard R.; and Krohn, W. Henrik, to Huyck Corporation. High temperature filter fabrics. B 832,316, Cl. 156-148.000.

Leger, Pierre: *See—*
Salles, Yvon; Leger, Pierre; and David, Gerard Andre, B 729,345, Cl. 156-345.000.

Leggett & Platt, Incorporated: *See—*
Adams, Elvin E.; Wells, Tom J.; Wentzek, Horst F.; Zapletal, Henry; and Zugel, Marty J., 4,112,726, Cl. 72-137.000.
Hampton, Edward L., B 803,955, Cl. 297-69.000.
Higgins, Larry, 4,112,528, Cl. 5-248.000.

Lehmann, Gerhard: *See—*
Werner, Paul; Wirtz, Egon; and Lehmann, Gerhard, B 786,815, Cl. 297-362.000.

Lehmkuhl, Herbert; and Rabet, Farroch, to Studiengesellschaft Kohle mbH. Method for the solubilizing of alkali metal salts with polyethyleneglycoldiethers and the utilization thereof. B 711,742, Cl. 252-363.500.

Lehtinen, Jukka A., to Dy. Tampella AB. Method of drying a cardboard or a paper web and drying device for applying this method. 4,112,586, Cl. 34-9.000.

Leikin, Roman Samuilovich: *See—*
Ryzhov, Vladimir Dmitrievich; Litvinenko, Semen Kirillovich; Leikin, Roman Samuilovich; Kulberg, Anton Yanovich; Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich, B 704,693, Cl. 221-171.000.

Leinonen, Erkki Ilmari; and Kiuru, Erkki Sakari, to Outokumpu Oy, Ab. Method of improving the temperature stability of a voltage source, and a stabilized voltage source for carrying out the method. B 735,983, Cl. 323-17.000.

Leiter, Robert, to Webasto-Werk W. Baier GmbH & Co. Sliding and tilting roof for a motor vehicle. B 863,709, Cl. 296-137.00G.

Leitold, Matyas: *See—*
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, B 812,325, Cl. 260-570.900.

Lelental, Mark; and Light, William Andrew, to Eastman Kodak Company. Electrophotographic elements and processes. B 824,136, Cl. 96-1.00R.

LeMay, Christopher Archibald Gordon, to EMI Limited. Radiography. B 781,961, Cl. 250-445.00T.

Lentsbergs, Ivars Petrovich: *See—*
Aren, Avgust Karlovich; Berzinya, Irma Arnoldovna; and Lentsbergs, Ivars Petrovich, B 679,869, Cl. 544-152.000.

Lenz, Arnold: *See—*
Kreuzburg, Gerhard; Lenz, Arnold; and Rogler, Walter, B 706,864, Cl. 260-448.80A.

Lepper, James M., Jr., to Climet Instruments Company. Photometer. B 725,027, Cl. 356-103.000.

Lerche, Heinz, to Varian Mat GmbH. Integrating circuit. B 755,881, Cl. 307-229.000.

Lerman, Michael J.: *See—*
Schlosberg, Seymour; and Lerman, Michael J., 4,112,572, Cl. 29-401.00R.

Lesas, Claude H.; and Pierre, Michel, to S. A. Beghin-Say. Cross-linking of cellulose fibers in gas suspension. B 731,895, Cl. 536-56.000.

Leser, Robert: *See—*
Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, B 808,767, Cl. 260-448.20E.

Levart, Michel Marc: *See—*
Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, B 605,926, Cl. 204-180.00R.

Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, to Saint-Gobain Industries. Fiberization energy conservation. B 829,515, Cl. 65-5.000.

Leveen, Harry H.; and Joyce, Patrick J. Microbiocidal composition and articles prepared therefrom. B 677,135, Cl. 424-28.000.

Levine, Walter E., to Bindicator Company. Optical sight tube for fluid conduits. B 777,433, Cl. 356-201.000.

Lewis, Barry R. Mast stepping and unstepping structure. 4,112,861, Cl. 114-91.000.

Lewis, John C., to Park-Ohio Industries, Inc. Test circuit and method for matching an induction load to a solid state power supply. B 835,157, Cl. 219-10.410.

Lewis, Richard Newton, to SWS Silicones Corporation. Silicone elastomers containing alkoxysiloxanols. B 769,062, Cl. 260-37.0SB.

Leyan S.r.l.: *See—*
Lecce, Giovanni; and Andena, Paolo, 4,112,530, Cl. 7-146.000.

Liaaen, Anders Marius, to A.M. Liaaen A/S. Propeller mechanism having removable propeller shaft. 4,112,866, Cl. 115-34.00R.

Libbey-Owens-Ford Company: *See—*
Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., B 767,051, Cl. 225-2.000.

Liberman, Harvey W.; and Whitehead, James Stephen, to Carrier Corporation. Methods and apparatus for controlling an hydraulic cylinder. 4,112,823, Cl. 91-36.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Keiner, Hildegard; Schmid, Emil; and Richly, Walter, B 742,688, Cl. 427-108.000.
Klank, Otto, B 814,103, Cl. 325-453.000.
Stiltz, Erwin; Hoyer, Rudolf; and Lindenmayer, Heinz, B 789,680, Cl. 173-116.000.

Lieber, Raymond S. Noise reduction device for impact tools. B 676,878, Cl. 181-230.000.

Liebman, Alan: *See—*
Fraser, Lawrence J.; and Liebman, Alan, B 758,538, Cl. 355-4.000.

Liermann, Peter: *See—*
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, B 809,886, Cl. 303-105.000.

Light, William Andrew: *See—*
Lelental, Mark; and Light, William Andrew, B 824,136, Cl. 96-1.00R.

Lin Offshore Engineering, Inc.: *See—*
Chow, Philip Y., 4,112,697, Cl. 405-209.000.

Lindberg, John E., to Owen, Wickersham & Erickson. Combustion control system for adding fluid above the butterfly valve. 4,112,892, Cl. 123-119.00A.

Lindblad, Lars Alfred, to Atlas Copco Aktiebolag. Method and arrangement for positioning a working tool to a predetermined direction and/or a predetermined point. B 830,213, Cl. 173-1.000.

Linde Aktiengesellschaft: *See—*
Forg, Wolfgang, 4,112,700, Cl. 62-28.000.

Lindenmayer, Heinz: *See—*
Stiltz, Erwin; Hoyer, Rudolf; and Lindenmayer, Heinz, B 789,680, Cl. 173-116.000.

Linder, Gerald S. Adjustable frame assembly for supporting a surgical tray. B 722,798, Cl. 248-291.000.

Lindner, Gerhard: *See—*
Helfgen, Werner; Lindner, Gerhard; Lingens, Paul; and Kaufmann, Helmut, B 702,593, Cl. 264-3.00R.

Lingens, Paul: *See—*
Helfgen, Werner; Lindner, Gerhard; Lingens, Paul; and Kaufmann, Helmut, B 702,593, Cl. 264-3.00R.

Linkies, Adolf; Reuschling, Dieter-Bernd; Kuhlein, Klaus; Beck, Gerhard; and Musil, Josef, to Hoechst Aktiengesellschaft. Pyrrolidones, pharmaceutical compositions therewith and processes of use thereof. B 751,173, Cl. 424-274.000.

Lippacher, Wolfgang; and Teger, Gerhard, to Hilti Aktiengesellschaft. Depth stop for a drilling machine. B 791,950, Cl. 408-241.00S.

Lissner, Reinhard: *See—*
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, B 739,142, Cl. 424-205.000.

Litteral, Carl J., to Union Carbide Corporation. Disproportionation of chlorosilane. B 724,919, Cl. 423-342.000.

Litton Systems, Inc.: *See—*
Coutant, Ralph W., 4,112,571, Cl. 29-243.500.

Litvinenko, Semen Kirillovich: *See—*
Ryzhov, Vladimir Dmitrievich; Litvinenko, Semen Kirillovich; Leikin, Roman Samuilovich; Kulberg, Anton Yanovich; Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich, B 704,693, Cl. 221-171.000.

Liu, Cheng-Yih: *See—*
Bassous, Ernest; and Liu, Cheng-Yih, B 861,373, Cl. 156-662.000.

Livesey, Donald V.: *See—*
Clark, James A.; Livesey, Donald V.; and Wrue, Richard J., B 762,221, Cl. 249-105.000.

Livorsi, Carl F.: *See—*
Simmons, Kenneth C.; Champlin, Harry C., Jr.; Livorsi, Carl F.; and Wucik, Joseph A., Jr., B 797,921, Cl. 277-168.000.

Livshits, Abram Lazarevich: *See—*
Vasiliev, Vladimir Sergeevich; Annenberg, Ernest Alexandrovich; Livshits, Abram Lazarevich; Polotsky, Vadim Evgenievich; and Lakhtjukhov, Valery Mikhailovich, B 780,357, Cl. 219-69.00W.

Lock, Alan Howard: *See—*
Aldridge, Trevor John; Lock, Alan Howard; and Bell, Robert Martin Alistair, 4,112,747, Cl. 73-116.000.

Lockheed Corporation: *See—*
Peaster, Bertram Anthony, B 759,756, Cl. 184-41.000.

Loew, Peter; and Koller, Stefan, to Ciba-Geigy Corporation. Basic azo dyes. B 676,599, Cl. 260-147.000.

Logan, James D.: *See—*
Talbott, John W.; and Logan, James D., B 747,391, Cl. 264-24.000.

Logsdon, John S.; and Meiner, George H., III, to Caterpillar Tractor Co. Link-supported instrument panel guard. 4,112,718, Cl. 70-159.000.

Logutov, Igor Jurievich: *See—*
Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Sobolev, Valerian Mikhailovich; Rutman, Grigory Iosifovich; Logutov, Igor Jurievich; and Dolidze, Vladimir Romanovich, B 788,590, Cl. 568-789.000.

Lohse, Udo: *See—*
Noack, Rolf; Schuster, Joachim; and Lohse, Udo, 4,112,728, Cl. 72-154.000.

Lolachi, Houshang, to Baxter Travenol Laboratories, Inc. Centrifugal liquid processing apparatus. B 657,187, Cl. 233-25.000.

Lomnitzer, Abraham: *See—*
Hill, David Arthur; and Lomnitzer, Abraham, 4,112,593, Cl. 35-19.00A.

Long, Lewis Frank, to Everett/Charles, Inc. Network testing method and apparatus. B 751,989, Cl. 324-73.0AT.

Long, Marshall, to Marlen Research Corporation. Method of cooking a flowable food product in a continuous flow scraped surface heat exchanger. B 841,890, Cl. 426-512.000.

Lonstrup, Thorkild F.; Brownawell, Darrell W.; Goletz, Edward, Jr.; and Numair, Solomon J., to Exxon Research & Engineering Co. Lubricating oil composition containing a dispersing-varnish inhibiting combination of an oxazoline compound and an acyl nitrogen compound. B 741,032, Cl. 252-51.50A.

Loqvist, Kaj-Ragnar, to Seco Tools Aktiebolag. Method of making a composite roller. 4,112,564, Cl. 29-148.40D.

Lostutter, Rollie. Method for tinting caulk. B 875,522, Cl. 366-348.000.

Loughrie, Gregory D., to CF Industries, Inc. Wet grinding method for crude phosphate rock. B 834,281, Cl. 241-15.000.

Louthan, Rector P.; and Doss, Richard C., to Phillips Petroleum Company. Poly(oxyalkylene)-polyester-poly(sulfide)-polythiol prepared by ester interchange. B 737,948, Cl. 528-279.000.

Loyd, Morris S., to Rockwell International Corporation. Composite load coupler for reinforcing composite structural joints. B 791,360, Cl. 428-162.000.

Lozanov, Merrill: *See—*
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Lucas Industries Limited: *See—*
Lumby, Roland John; North, Bernard; and Taylor, Alfred James, B 802,172, Cl. 106-73.400.
Tassano, Peter Francis, 4,112,744, Cl. 73-61.10R.

Lucas, Larry D.: *See—*
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Luciani, Luciano: *See—*
Matteoli, Mario; and Luciani, Luciano, B 755,503, Cl. 260-878.00B.

Lucifer S.A.: *See—*
Stampfli, Harald, B 718,545, Cl. 361-154.000.

Ludwig Taprogge, Reinigungsanlagen fur Rohren-Warmeaustauscher: *See—*
Treplin, Friedrich-Wilhelm; and Borchert, Werner, B 781,489, Cl. 165-95.000.

Luetzow, Edwin J., to TelTec, Incorporated. Relay seal cap. B 695,514, Cl. 29-630.00B.

Luh, Bing Yu: *See—*
Belleau, Bernard R.; Doyle, Terrence W.; Luh, Bing Yu; and Conway, Terry T., B 760,620, Cl. 544-105.000.

Lumby, Roland John; North, Bernard; and Taylor, Alfred James, to Lucas Industries Limited. Method of forming a ceramic product. B 802,172, Cl. 106-73.400.

Lummus Company, The: *See—*
Bauer, William V., B 843,413, Cl. 208-89.000.
Tsao, Utah, B 673,095, Cl. 260-659.00A.

Lund, Roger Edward, to Sperry Rand Corporation. Bubble domain structuring in bubble domain memory plane. B 786,316, Cl. 365-2.000.

Lunden, Risto Waldemar: *See—*
Ebeling, Martti Olavi Aladar; and Lunden, Risto Waldemar, 4,112,691, Cl. 405-119.000.

Lupfer, David A., to Dielectric Laboratories, Inc. Stripline capacitor. B 744,237, Cl. 333-84.00M.

Lupien, Jacques: *See—*
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Lusa, George; and Mathues, Thomas P., to General Motors Corporation. Wheel cylinder. B 836,140, Cl. 188-364.000.

Lussling, Theodor: *See—*
Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, B 802,946, Cl. 260-545.00R.

Luthringer, Jean: *See—*
Combette, Marc; Dorgnon, Roger; Luthringer, Jean; and Ollivier, Jean, B 805,663, Cl. 227-10.000.

Lutz, David Edward. Loading and unloading apparatus for vehicles. B 784,405, Cl. 214-82.000.

Lyssy, Georges H. Process and apparatus for the isostatic measurement of the permeability of a material to the passage therethrough of a gas or vapor. 4,112,739, Cl. 73-38.000.

M. E. Heuck Company: *See—*
Heuck, Roger W., 4,112,537, Cl. 15-105.000.

Maa, Peter S.: *See—*
Gorbaty, Martin L.; Tao, Frank F.; and Maa, Peter S., B 693,830, Cl. 208-8.000.

Maass, Edward A.; and Stoneberg, William A., to Magnecorp, Inc. Shelf management device. 4,112,598, Cl. 35-53.000.

Macchine Tessili Circolari Matec S.p.A.: *See—*
Bini, Franco, 4,112,712, Cl. 66-157.000.

MacCracken, Calvin Dodd, to Calmac Manufacturing Corporation. Method and system for utilizing a flexible tubing solar collector. 4,112,921, Cl. 126-271.000.

Mackenzie, Raymond W.: *See—*
Oates, Robert M.; and Mackenzie, Raymond W., B 783,525, Cl. 318-473.000.

MacLean, Donald L.; and Estes, Robert T., to Monsanto Company. Polyester filament-forming polymer and its method of production. B 699,543, Cl. 528-289.000.

MacLennan, P. H. Barry; Ireland, Graham A.; and Werba, William J., to Canadian Patents and Development Limited. Ultrasonic air data system. 4,112,756, Cl. 73-181.000.

Maeda, Masaya: *See—*
Suzuki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, B 736,223, Cl. 352-194.000.

Maeda, Shigeru: *See—*
Kiuchi, Mitsuyuki; Amagami, Keizo; Maeda, Shigeru; and Saegusa, Shigeharu, B 764,983, Cl. 219-10.49R.

Maejima, Tetsuo: *See—*
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.

Mages, Bernhard: *See—*
Rock, Erich; and Mages, Bernhard, 4,112,543, Cl. 16-164.000.

Magnecorp, Inc.: *See—*
Maass, Edward A.; and Stoneberg, William A., 4,112,598, Cl. 35-53.000.

Magnusson, Alan B.: *See—*
Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., B 878,679, Cl. 521-95.000.

Mahar, Kevin D., to Donner-Hanna Coke Corporation. Coke air pollution control method and apparatus. B 635,594, Cl. 201-39.000.

Maier, Alfred E.; Armstrong, Donald D.; and Farley, James R., to Westinghouse Electric Corp. Circuit breaker spring assembly. B 829,702, Cl. 200-153.00G.

Maierhofer, Alfred: *See—*
Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, B 802,946, Cl. 260-545.00R.

Majefski, Richard Lee: *See—*
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Majewski, Helmut W.: *See—*
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Makabe, Hachiro: *See—*
Kakinuma, Toshihide; Kume, Toshiaki; Takenoya, Hideaki; Makabe, Hachiro; and Watanabe, Kazuo, 4,112,858, Cl. 112-158.00E.

Makarenko, Valery Leonidovich: *See—*
Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich, B 679,437, Cl. 169-12.000.

Make, Siegfried: *See—*
Rambacher, Paul; and Make, Siegfried, B 831,053, Cl. 544-314.000.

Maki, Masao; Kaneko, Yasunori; Tsuruda, Kunihiro; and Kobayashi, Ikuo, to Matsushita Electric Industrial Co., Ltd. Nitrogen oxides removal method. B 846,495, Cl. 423-239.000.

Makurin, Pavel Semenovich: *See—*
Goryachev, Vladimir Ilich; Kotelnikov, Grigory Vladimirovich; and Makurin, Pavel Semenovich, 4,112,734, Cl. 73-15.00B.

Malinski, Richard F.; and Childers, Aubrey C. Mechanical torque limit for valve actuator. B 761,596, Cl. 318-475.000.

Maloney, Thomas C.; and Cola, Rudolph A., to Burroughs Corporation. Display panel with phosphors. B 685,526, Cl. 340-343.000.

Malpass, Dennis B.; and Yeargin, G. Scott, to Texas Alkyls, Inc. Reduction of triphenylphosphine oxide to triphenylphosphine. B 805,194, Cl. 260-606.50P.

Manabe, Kenshi; and Satou, Kouichirou, to Tokyo Shibaura Electric Co., Ltd. Presettable dynamic delay flip-flop circuit. B 801,254, Cl. 307-279.000.

Manda, John G.; Burroughs, Joe D.; and Cairns, Donald F., to National Steel Corporation. Pollution control system including a one-spot quench-car for coke producing installations. B 647,937, Cl. 202-227.000.

Manfredi, Dario John. Airchute ejection. B 739,709, Cl. 244-139.000.

Manger, Hansjorg; Sohner, Gerhard; and Hohne, Gerd, to Robert Bosch GmbH. Controlled ignition system for an internal combustion engine to provide, selectively, one or more ignition pulses for any ignition event. 4,112,890, Cl. 123-117.00R.

Mann, Gamdur S., to General Motors Corporation. Method of making electric heater. 4,112,577, Cl. 29-611.000.

Manufacturers Systems, Inc.: *See—*
Anderson, Leroy E.; Charlson, David V.; and Vierkant, Mark A., 4,112,731, Cl. 72-320.000.

Manufacturing Approaches & Total Concepts, Inc.: *See—*
Strange, Delbert D.; and Hunts, Ronald M., 4,112,986, Cl. 144-323.000.

Manuszak, Edward J. Combination carrying case and step unit. B 801,730, Cl. 224-46.00R.

Maraschin, Norma J.: *See*—
Lagow, Richard J.; Adcock, James L.; and Maraschin, Norma J., B 379,876, Cl. 422-191.000.

Marcade, Roque Denis, to Whirlpool Corporation. Drier appliance control. 4,112,588, Cl. 34-45.000.

Marchetti, Silvano. Device for monitoring absolute velocity of points of driven piles during impact. 4,112,733, Cl. 73-12.000.

Marden Manufacturing Company, Inc.: *See*—
Bradley, Edmund G., 4,112,857, Cl. 111-3.000.

Marder, William Z., to Zevco Enterprises, Inc. Knife sharpener. 4,112,790, Cl. 76-87.000.

Marecek, Paul M.: *See*—
Armstrong, Donald E.; Shaffer, John W.; Marecek, Paul M.; and Audesse, Emery G., B 724,792, Cl. 431-95.00A.

Mares, Fred Ralph: *See*—
Colglazier, Donald Francis; Fallon, John Leslie; Kollar, Ernest Paul; and Mares, Fred Ralph, B 788,570, Cl. 271-10.000.

Margalit, Nehemiah, to ESB Incorporated. Non-aqueous primary battery having a pure silver chromate cathode. B 851,414, Cl. 429-194.000.

Margen, Peter Heinrich Erwin; and Naslund, Rolf Paul, to Aktiebolaget Atomenergi. Method of manufacturing a heat exchanger. 4,112,569, Cl. 29-157.30R.

Marhic, Michel E.: *See*—
Epstein, Max; Marhic, Michel E.; and Schacham, Samuel E., B 753,292, Cl. 331-94.50C.

Marine Moisture Control Co., Inc.: *See*—
Cigliano, Irving Louis, B 784,702, Cl. 151-54.000.

Marino, Angelo. Tape reel holder. B 805,587, Cl. 242-106.000.

Mark Controls Corporation: *See*—
Carlson, Donald E., 4,112,966, Cl. 137-282.000.

Mark, Victor, to General Electric Company. Non-opaque flame-retardant polycarbonate composition. B 733,015, Cl. 260-45.80N.

Mark, Victor; and Hedges, Charles Vernon, to General Electric Company. Process for purifying impure diphenols. B 755,981, Cl. 568-750.000.

Marketing Masters: *See*—
Gauron, Richard F.; and Laconte, Susana S., B 814,330, Cl. 292-165.000.

Markovski, Ognian. Hand held device for packing grease into wheel bearings. B 774,324, Cl. 184-1.00D.

Marks, Thomas L. Telephone cradle adapter. B 827,623, Cl. 179-146.00R.

Marlen Research Corporation: *See*—
Long, Marshall, B 841,890, Cl. 426-512.000.

Marlowe, Frank Jerome: *See*—
Pankove, Jacques Isaac; and Marlowe, Frank Jerome, B 775,864, Cl. 324-121.00R.

Marsh, Charles W. Hair dryer. 4,112,591, Cl. 34-99.000.

Marsh, Paul G.; and Kohlhepp, Dean H., to Black Clawson Fibreclaim, Inc. Process for producing fuel from solid waste. B 804,786, Cl. 241-21.000.

Martensson, Folke Lennart, to Telefonaktiebolaget L M Ericsson. Arrangement to indicate signals having a length exceeding a limit value. B 755,035, Cl. 328-111.000.

Martin, Joseph: *See*—
Dayet, Jacques; Martin, Joseph; and Nicola, Charles, B 727,750, Cl. 200-148.00A.

Martin Marietta Aluminum Inc.: *See*—
Gilbert, Henry L.; and Van Ordstrand, Cayrl W., 4,112,846, Cl. 102-52.000.

Masahiko, Takehara: *See*—
Juichi, Imamura; Masahiko, Takehara; and Kazuhiro, Kizawa, B 657,887, Cl. 260-600.00R.

Maschinenfabrik Kern AG Konolfingen: *See*—
Brechbuhl, Heinz, 4,112,796, Cl. 83-141.000.

Maschinenfabrik Zuckermann Komm. Ges.: *See*—
Schmidt, Erich, 4,112,628, Cl. 51-140.000.

Masco Corporation of Indiana: *See*—
Pflasterer, Peter W., B 690,881, Cl. 325-470.000.

Maselli, Vincent M. Process for making photo-mechanical drop-out mask. B 802,798, Cl. 96-5.000.

Mason, Russell I.; and Dale, John R., to United States of America, Navy. Directional sonobuoy. B 535,332, Cl. 340-85.000.

Masri, Merle S.; Randall, Virginia G.; and Stanley, William L., to United States of America, Agriculture. Insolubilization of enzymes on modified phenolic polymers. B 827,659, Cl. 195-63.000.

Massachusetts Institute of Technology: *See*—
Driscoll, Michael J.; and Bowman, Frank L., B 723,403, Cl. 176-38.000.
Lagow, Richard J.; Adcock, James L.; and Maraschin, Norma J., B 379,876, Cl. 422-191.000.
Modell, Michael; Reid, Robert C.; and Amin, Sanjay I., B 742,712, Cl. 48-202.000.

Massardo, Pietro: *See*—
Modena, Mario; Massardo, Pietro; and Castelnuovo, Lucio, B 695,748, Cl. 260-31.8HA.

Massey-Ferguson Services N.V.: *See*—
Sala, Angelo, 4,112,976, Cl. 137-636.200.

Masuda, Bunpei: *See*—
Yoshizawa, Isamu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,112,798, Cl. 83-344.000.

Masuda, Hajime: *See*—
Yamazaki, Shunji; and Masuda, Hajime, B 833,072, Cl. 340-531.000.

Masukawa, Toyoaki: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, B 814,121, Cl. 96-60.00R.

Mathers, James E.: *See*—
Ferri, John L.; Mathers, James E.; and Yale, Ramon L., B 525,589, Cl. 252-301.40S.

Mathes, Dieter: *See*—
Steinfeld, Horst E.; and Mathes, Dieter, B 762,347, Cl. 238-349.000.

Mathues, Thomas P.: *See*—
Lusa, George; and Mathues, Thomas P., B 836,140, Cl. 188-364.000.

Matsubara, Masaki, to Olympus Optical Co., Ltd. Zoom lens system with high zooming ratio. B 788,961, Cl. 350-186.000.

Matsui, Takashi; Sugimura, Sadao; and Noo, Kunio, to Sekisui Kaseikin Kogyo Kabushiki Kaisha. Process for producing receptacles from a thermoplastic resin foam sheet. B 703,421, Cl. 264-230.000.

Matsumoto, Akiyoshi: *See*—
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, B 780,843, Cl. 195-68.000.

Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; and Suzuki, Shosuke, to Bridgestone Tire Company Limited. Sound absorbing body. B 730,115, Cl. 181-284.000.

Matsumura, Shiunzi: *See*—
Oshio, Hiromichi; Konishi, Hiroyuki; Matsumura, Shiunzi; Ishikawa, Kikuichi; and Yoneyama, Eiichi, B 776,618, Cl. 71-76.000.

Matsunaga, Kazuo; Ishizawa, Hideo; and Kurata, Kenichi, to Toppan Printing Co., Ltd. Method for manufacture of expanded articles having an embossed surface. B 735,523, Cl. 96-38.100.

Matsunami, Shoichi: *See*—
Koike, Sakae; Matsunami, Shoichi; Goto, Yorinobu; and Tanabe, Yoshio, B 755,936, Cl. 423-235.000.

Matsuo, Syunji: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, B 814,121, Cl. 96-60.00R.

Matsuoka, Shingo: *See*—
Hagiwara, Miyuki; Araki, Kunio; Matsuoka, Shingo; and Fujimura, Syunichi, B 639,066, Cl. 204-159.170.

Matsushita, Akira. Information processing optical device. B 746,830, Cl. 350-171.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Aya, Masayoshi; and Hiya, Kohji, B 808,567, Cl. 335-212.000.
Kiuchi, Mitsuyuki; Amagami, Keizo; Maeda, Shigeru; and Saegusa, Shigeharu, B 764,983, Cl. 219-10.49R.
Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, B 626,098, Cl. 325-320.000.
Maki, Masao; Kaneko, Yasunori; Tsuruda, Kunihiro; and Kobayashi, Ikuo, B 846,495, Cl. 423-239.000.
Minakuchi, Hiroshi, B 818,842, Cl. 318-341.000.
Ookubo, Toshio; Nishino, Atsushi; and Suzuki, Tadashi, B 721,545, Cl. 422-177.000.

Matsushita Electric Works, Ltd.: *See*—
Inoue, Hiromitsu; Ohashi, Hiroshi; and Katayama, Susumu, B 719,159, Cl. 340-558.000.

Matsushita Electronics Corporation: *See*—
Okumura, Tomisaburo; Okazaki, Hiroshi; Tsuchitani, Akira; and Ueda, Seiji, B 763,679, Cl. 148-187.000.

Matsuura, Ryo; Nakatani, Shuichi; Nagaoka, Kazuya; and Hioki, Katsuhiko, to Kawasaki Kasei Chemicals Ltd. Process for producing anthrone. B 818,761, Cl. 260-351.000.

Matteoli, Mario; and Luciani, Luciano, to Montedison S.p.A. Process for preparing polypropylene compositions having high impact strength at low temperatures. B 755,503, Cl. 260-878.00B.

Mattmuller, Rene, to Saint-Gobain Industries. Method and apparatus for melting mineral materials. B 767,441, Cl. 65-135.000.

Mattuschka, Werner, to Siemens Aktiengesellschaft. Thickness shear resonator for use as an over-tone quartz crystal. B 830,046, Cl. 310-326.000.

Maurer, Fritz; Riebel, Hans-Jochem; Homeyer, Bernhard; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. O-alkyl-O-[4-alkylpyrimidin(2)yl]-(thiono)-(thioi) phosphoric (phosphonic) acid esters and insecticidal, acaricidal and nematocidal compositions containing them. B 645,128, Cl. 424-200.000.

Maycock, Ian Commander, to Automotive Products Limited. Driven plates for friction clutches. B 797,768, Cl. 192-107.00C.

Mayr, Adolfo; Davoli, Velmore; Leccese, Antonio; and Susa, Ermanno, to Montecatini Edison S.p.A. Catalysts for the polymerization of olefins. B 733,709, Cl. 252-429.00C.

Mazdiyasni, Khodabakhsh S.; and Cooke, Charles M., to United States of America, Air Force. Method of fabricating silicon nitride bodies. B 452,038, Cl. 264-101.000.

Mazik, Paul E., Jr.: *See*—
Ehrhart, Leonard M.; Pratte, John R.; and Mazik, Paul E., Jr., 4,112,621, Cl. 49-400.000.

Mazuir, Maurice, to Etablissements Carpano & Pons. Electronic programmer having automatic program selection. B 762,231, Cl. 364-900.000.

McAlindon, Harold P.: *See*—
Carol, John A., Jr.; and McAlindon, Harold P., B 845,959, Cl. 235-96.000.

McBrien, Roderick Julian, to Chloride Group Limited. Cell racks. B 825,718, Cl. 429-99.000.

McCabe, Barkman C.; and Zajac, Edward, to Westinghouse Electric

Corp. High temperature geothermal energy system. 4,112,745, Cl. 60-641.000.

McCabe, Francis J. Smoke, fire and air control damper with stamped blade. B 729,831, Cl. 251-305.000.

McCabe, Francis J. Rotating blade fire damper. B 770,831, Cl. 251-305.000.

McCartney, Thomas: *See—*
Ashdown, Glynn R.; McCartney, Thomas; and Holmes, Bruce, B 622,054, Cl. 179-175.30R.

McCool, John B., 3rd: *See—*
Putman, Edgar N.; Patterson, George; Wimer, Scotty; and McCool, John B., 3rd, B 601,628, Cl. 252-363.500.

McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., to Tennessee Valley Authority. Preparation of dicalcium phosphate from phosphate rock by the use of sulfur dioxide, water, and carbonyl compounds. B 779,038, Cl. 423-308.000.

McCutcheon, Martin J.: *See—*
Fletcher, Samuel G.; and McCutcheon, Martin J., 4,112,596, Cl. 35-35.00R.

McDevitt, Robert F. Molten metal sampler. 4,112,770, Cl. 73-425.40R.

McDevitt, Robert F. Device for receiving a sample of molten metal. 4,112,771, Cl. 73-425.40R.

McDevitt, Robert F. Device and method for obtaining a sample of liquid. 4,112,772, Cl. 73-425.40R.

McDonald, Charles H. Method of pavement repair. B 784,615, Cl. 404-75.000.

McDonnell, Damien Gerard: *See—*
Coates, David; Gray, George William; and McDonnell, Damien Gerard, B 821,146, Cl. 252-299.000.

McDonnell Douglas Corporation: *See—*
Lazenby, Webber W.; and Pulliam, Daniel N., B 820,930, Cl. 220-5.00A.

McElroy, John O., Jr., to Berkmont Industries. Unitary elastic muffler assembly for a pneumatic device. B 750,330, Cl. 181-230.000.

McEwen, Colin Dougal: *See—*
Denne, Phillip Raymond Michael; Davies, David Evan Naunton; and McEwen, Colin Dougal, B 723,621, Cl. 343-6.8LC.

McGahee, Welbourne D. Method and apparatus for fabricating fishing lures etc. 4,112,608, Cl. 43-42.090.

McGarry, Francis J.; Greene, Donald; and Otto, Jeffrey B., to Rogers Corporation. Method of manufacturing insulating board. B 847,571, Cl. 162-123.000.

McGraw-Edison Company: *See—*
Cameron, Gordon, B 777,050, Cl. 292-40.000.

McGregor, William H.: *See—*
Garsky, Victor M.; and McGregor, William H., B 538,628, Cl. 260-112.50S.

McHenry, Donald L.; and Bechtel, Charles H., to PPG Industries, Inc. Method of preparing a solution for making electroconductive tin oxide films. B 746,270, Cl. 106-287.180.

McKay, Tom W.: *See—*
Lawrence, Walter W., Jr.; McKay, Tom W.; and Wiegand, Karl E., B 807,738, Cl. 562-568.000.

McKee, Harry A. Miniaturized model kitchen having coordinated interchangeable and integratable modules. B 800,617, Cl. 354-81.000.

McKee, William H., to TRW Inc. Connector constructions and mounting means and hoods therefor. B 736,895, Cl. 339-91.00R.

McKee, William H., to TRW Inc. Connector constructions and attaching means therefor. B 736,942, Cl. 339-91.00R.

McKinney, Lynn B.: *See—*
Dietz, Raymond A. F.; Fundom, Danny L.; Henning, George J.; and McKinney, Lynn B., B 744,965, Cl. 206-508.000.

McKnight, James Alan, to United Kingdom Atomic Energy Authority. Detection of bubbles in a liquid. 4,112,735, Cl. 73-19.000.

McLean, Graham Wilson; and Holt, David, to Strathearn Audio Limited. Electric motor. B 797,252, Cl. 310-163.000.

McMaster, James David. Secret compartment case. B 843,566, Cl. 312-204.000.

McPherson, Neil Soden. Meeting rail for sliding windows. 4,112,623, Cl. 49-488.000.

Mead Corporation, The: *See—*
Spatz, Sydney Martin; and Shackle, Dale Richard, B 767,543, Cl. 282-27.500.

Medcor, Inc.: *See—*
Shanker, Irvin Paul; and Tryciecky, Teodozij, 4,112,953, Cl. 128-419.00P.

Meged, Nelli Fillipovna: *See—*
Mirsky, Yakov Volfovich; Dorogochinsky, Akivy Zinovievich; Meged, Nelli Fillipovna; and Kosolapova, Antonina Pavlovna, B 710,651, Cl. 423-329.000.

Meier, Linus: *See—*
Werder, Roger Daniel; Meier, Linus; and Lang, Karl, B 551,517, Cl. 422-65.000.

Meiji Seika Kaisha, Ltd.: *See—*
Kai, Fumio; Saito, Toshinori; Seki, Shigeo; and Kawasaki, Toyoaki, B 588,555, Cl. 544-27.000.

Meijs, Franciscus H., to Shell Oil Company. Process for treating wells with viscous epoxy-resin-forming solutions. B 852,175, Cl. 166-295.000.

Meiner, George H., III: *See—*
Logsdon, John S.; and Meiner, George H., III, 4,112,718, Cl. 70-159.000.

Meisch, Charles Edward: *See—*
Rosenthal, Arthur Lee; Alpern, Marvin; and Meisch, Charles Edward, 4,112,949, Cl. 128-278.000.

Melnick, Igor, to Commissariat a l'Energie Atomique. Evaporation source for vacuum deposition. B 797,849, Cl. 13-22.000.

Melocik, Grant C., to Towmotor Corporation. Control apparatus. B 813,030, Cl. 307-9.000.

Melton, Rosser B., Jr.; Colburn, John W., Jr.; and Wood, Charles D., III, to Southwest Research Institute. Combustion apparatus for generating repetitive explosions. B 515,310, Cl. 299-13.000.

Meng, Ilse Heide Frieda, heir: *See—*
Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, B 693,971, Cl. 548-377.000.

Meng, Ilse Heide Frieda, heiress: *See—*
Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, B 766,235, Cl. 424-273.00P.

Meng, Karl, deceased: *See—*
Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, B 766,235, Cl. 424-273.00P.

Meng, Karl-August, deceased: *See—*
Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, B 693,971, Cl. 548-377.000.

Mentschel, Hellmuth, to Siemens Aktiengesellschaft. Method and apparatus for starting up a gas generator for converting hydrocarbons into a fuel gas, and an internal combustion engine to be supplied with the fuel gas. 4,112,876, Cl. 123-3.000.

Menzi, Ulrich, to Hermes Precisa International S.A. Mechanism for actuating a member of a typewriter. B 696,864, Cl. 400-333.000.

Menzin, Marvin: *See—*
Turner, Robert Bruce; Menzin, Marvin; Robinson, Hugh A.; and Williams, Thomas S., 4,112,762, Cl. 73-343.00R.

Merck & Co., Inc.: *See—*
Smith, Robert L.; Stokker, Gerald E.; and Cragoe, Edward J., Jr., B 833,930, Cl. 424-303.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, B 739,142, Cl. 424-205.000.
Seubert, Jurgen; Thomas, Herbert; and Andrews, Peter, B 742,132, Cl. 424-250.000.

Merkulov, Alexandr Nikolaevich: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.

Merrick, James Walter: *See—*
Chapin, Leonard Lee; and Merrick, James Walter, 4,112,901, Cl. 123-139.00E.

Merrill Brothers: *See—*
Kopp, Valentine T., B 710,736, Cl. 294-104.000.

Merz, Walter, to Bayer Aktiengesellschaft. Process for the preparation of alkali metal salts of 3,3-dimethyl-2-oxo-butyric acid. B 640,830, Cl. 562-577.000.

Meshberg, Philip. Dispensing unit for liquid and method of dispensing. B 633,799, Cl. 222-1.000.

Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung: *See—*
Held, Manfred; and Spies, Hans, 4,112,844, Cl. 102-19.200.
Krause, Alois, 4,112,824, Cl. 91-413.000.
Lallinger, Georg, 4,112,848, Cl. 102-69.000.
Rossmanith, Otto, B 764,022, Cl. 417-477.000.
Thomanek, Franz Rudolf, 4,112,847, Cl. 102-67.000.

Meteor AG: *See—*
Ott, Hans, B 835,032, Cl. 228-36.000.

Mettler Instrumente AG: *See—*
Werder, Roger Daniel; Meier, Linus; and Lang, Karl, B 551,517, Cl. 422-65.000.

Meyer, Robert W.; and Hall, George A., III, to Holcroft & Company. Heat exchanger core for recuperator. B 771,458, Cl. 165-154.000.

Meyers, George Leroy, to American Can Company. Tamperproof reclosable carton. B 805,096, Cl. 206-626.000.

Michalko, Edward, to UOP Inc. Catalytic composite and method of manufacture. B 786,527, Cl. 252-455.00Z.

Michishita, Kazuhiko: *See—*
Kamano, Yoshiaki; Michishita, Kazuhiko; Seki, Teruya; and Tanaka, Ichiro, B 671,693, Cl. 260-397.450.

Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Sobolev, Valerian Mikhailovich; Rutman, Grigory Iosifovich; Logutov, Igor Jurievich; and Dolidze, Vladimir Romanovich. Method of preparing 2,6-di-tert.butylphenol. B 788,590, Cl. 568-789.000.

Mickelson, Grant A., to Union Oil Company of California. Catalytic hydrofining process. B 846,419, Cl. 208-216.000.

Midana, Fiorenzo. Golfer's club swing and stance training device. B 764,816, Cl. 273-186.00C.

Mieyal, David F., to Donn Products, Inc. Adjustable pedestal for elevated floors. B 803,078, Cl. 248-354.00R.

Mihelic, Eli: *See—*
Krasovec, Branko; Mihelic, Eli; and Reutlinger, Suzana, B 778,319, Cl. 426-56.000.

Miida, Eishiro, to Tsukamoto Seiki Co., Ltd. Pressure tight joint for a large diameter casing. B 835,012, Cl. 285-334.000.

Mikes, Sandor: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury

Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.
Milianowicz, Stanislaw A.: *See*—
Frink, Russell E.; and Milianowicz, Stanislaw A., B 468,332, Cl. 200-144.00R.
Miller, Helmut, to Escher Wyss Limited. Supporting device. B 744,319, Cl. 308-9.000.
Miller, Mark L.: *See*—
Virkar, Anil V.; Miller, Mark L.; Cutler, Ivan B.; and Gordon, Ronald S., B 788,572, Cl. 429-193.000.
Miller, Stephen J., to Chevron Research Company. Denitrification process for hydrogenated distillate oils. B 773,995, Cl. 208-254.00R.
Miller, Stephen L.; and Dickert, Yancey J., to Dow Chemical Company, The. Poly-2-alkyl-2-oxazoline modified regenerated cellulosics. B 754,730, Cl. 260-9.000.
Milliken Research Corporation: *See*—
Hauser, Peter Jacob; and Kuhn, Hans Heinrich, B 815,122, Cl. 260-178.000.
Otto, Wolfgang K. F., B 799,620, Cl. 8-125.000.
Otto, Wolfgang K. F., B 799,623, Cl. 8-115.500.
Willbanks, Charles E., 4,112,560, Cl. 28-160.000.
Mills, Anthony Mark; and Buck, David Lyndon, to Dunlop Limited. Pneumatic tires having low aspect ratio. 4,112,994, Cl. 152-354.00R.
Min, Tony C.; and Hergert, Richard E., to Beloit Corporation. Apparatus for deflocculating fibrous wad and uniformly distributing the disintegrated fibrous material on a dry fiber layer forming surface. 4,112,549, Cl. 19-304.000.
Minagawa, Motonobu; Ohzeki, Toshio; and Sekiguchi, Tetsuo, to Argus Chemical Corporation. Tin sulfide stabilizer for styrene polymer. B 806,521, Cl. 260-23.70M.
Minakuchi, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Rotation control system. B 818,842, Cl. 318-341.000.
Minnesota Mining and Manufacturing Company: *See*—
Andrews, Jeffrey F.; Mullin, Therese A.; and Senkus, Raymond, B 758,342, Cl. 424-81.000.
Giulie, Joe D., B 625,131, Cl. 402-46.000.
Hensley, William G., B 743,463, Cl. 242-43.00R.
Howard, Robert N., 4,112,631, Cl. 51-295.000.
Larimore, Frank C., 4,112,941, Cl. 128-2.06E.
Minnis, Thomas R., to California Microwave, Inc. Compandor apparatus. B 738,835, Cl. 333-14.000.
Minolta Camera Kabushiki Kaisha: *See*—
Murata, Tomoji; and Shibazaki, Kenji, B 740,725, Cl. 355-14.000.
Nakamura, Yoshihiro; Shibazaki, Kenji; Kono, Tateomi; Inagaki, Syotaro; and Murata, Tomoji, B 736,189, Cl. 355-14.000.
Minowa, Masahiro, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Method for controlling voltage and providing temperature compensation in a thermal printer. B 736,046, Cl. 400-120.000.
Mintz, Marcus: *See*—
Engelhardt, Bernard H.; and Mintz, Marcus, 4,112,761, Cl. 73-312.000.
Mirsky, Yakov Volfovich; Dorogochinsky, Akivy Zinovievich; Meged, Nelli Fillipovna; and Kosolapova, Antonina Pavlovna. Process for the production of zeolites in the form of binderless spherical granules. B 710,651, Cl. 423-329.000.
Mischutin, Vladimir, to White Chemical Corporation. Flame retardants for natural and synthetic materials. B 751,661, Cl. 427-390.00D.
Mitchell, Albert W.: *See*—
Ballas, George C.; and Mitchell, Albert W., 4,112,653, Cl. 56-12.700.
Mitchell, Frank L. Protective workman and equipment covers. 4,112,633, Cl. 52-66.000.
Mitchell, Joseph W.: *See*—
Bush, Robert F.; and Mitchell, Joseph W., B 799,034, Cl. 148-6.350.
Mitchell, William O.: *See*—
Ellington, Gordon H.; Mitchell, William O.; and Estapa, Don E., 4,112,860, Cl. 112-262.000.
Mitsubishi Chemical Industries, Ltd.: *See*—
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, B 780,843, Cl. 195-68.000.
Koike, Sakae; Matsunami, Shoichi; Goto, Yorinobu; and Tanabe, Yoshio, B 755,936, Cl. 423-235.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Seo, Mamoru; and Uenishi, Akio, B 764,177, Cl. 307-311.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Yoshikawa, Yoshio; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, B 751,668, Cl. 252-428.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hirota, Nobuyoshi; and Shibata, Akio, B 775,328, Cl. 260-8.000.
Mizuno, Michitaka; Ideue, Kazuo; and Oya, Masashi, 4,112,759, Cl. 73-295.000.
Mitsugu, Watanabe: *See*—
Shogo, Iizuka; Mitsuo, Endo; Mitsugu, Watanabe; Toshio, Iizuka; and Kenji, Usui, B 737,025, Cl. 219-56.000.
Mitsuhashi, Kenhachi: *See*—
Itoh, Hiroyuki; Mitsuhashi, Kenhachi; and Akashi, Hiromitsu, 4,112,746, Cl. 73-95.000.
Mitsuo, Endo: *See*—
Shogo, Iizuka; Mitsuo, Endo; Mitsugu, Watanabe; Toshio, Iizuka; and Kenji, Usui, B 737,025, Cl. 219-56.000.
Mittag, Douglas C., to Aurora Equipment Company. Pallet rack and post protector assembly. B 782,185, Cl. 211-191.000.
Mitter, Mathias. Method of printing webs. 4,112,531, Cl. 8-149.000.
Miyachi, Isao: *See*—
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, B 780,843, Cl. 195-68.000.
Miyagi, Hideo, to Toyota Jidosha Kogyo Kabushiki Kaisha. System for introducing secondary air into an internal combustion engine. 4,112,678, Cl. 60-276.000.
Miyahara, Kingo, to Dowa Co., Ltd. Gasified liquid fuel burner. B 800,701, Cl. 431-122.000.
Miyakita, Hiroshi, to Miyakita, Ichiro. Rotary cutter drive control with electric motor. B 748,318, Cl. 318-601.000.
Miyakita, Ichiro: *See*—
Miyakita, Hiroshi, B 748,318, Cl. 318-601.000.
Miyasugi, Takeshi: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.
Miyazaki, Nobumasa: *See*—
Kagiyama, Yasuo; and Miyazaki, Nobumasa, B 793,359, Cl. 236-12.00A.
Mizuguchi, Ryuzo: *See*—
Nagata, Nobuyoshi; and Mizuguchi, Ryuzo, B 699,025, Cl. 260-29.4UA.
Mizuno, Michitaka; Ideue, Kazuo; and Oya, Masashi, to Mitsubishi Jukogyo Kabushiki Kaisha. Device for detecting the surface level of molten metal in a mold. 4,112,759, Cl. 73-295.000.
Mizutani, Koichi: *See*—
Takimoto, Masatami; and Mizutani, Koichi, 4,112,898, Cl. 123-136.000.
Mo Och Domsjo Aktiebolag: *See*—
Samuelson, Hans Olof, B 763,203, Cl. 162-34.000.
Mobil Oil Corporation: *See*—
Kaeding, Warren W.; and Young, Lewis Brewster, B 793,470, Cl. 260-673.000.
Nnadi, John C.; and Heilweil, Israel J., B 564,954, Cl. 544-296.000.
Stournas, Stamoulis; and Heiba, El Ahmadi I., B 770,164, Cl. 252-8.55D.
Mobile Aerial Towers, Inc.: *See*—
Myers, Lester L., B 783,938, Cl. 182-2.000.
Moczygemba, George A., to Phillips Petroleum Company. Hydrogenated 1,3-cyclohexadiene/1,3-butadiene copolymers. B 711,029, Cl. 526-25.000.
Modell, Michael; Reid, Robert C.; and Amin, Sanjay I., to Massachusetts Institute of Technology. Gasification process. B 742,712, Cl. 48-202.000.
Modena, Mario; Massardo, Pietro; and Castelnuovo, Lucio, to Montedison S.p.A. Halogenated esters of polycarboxylic acids and plasticizers for chloro-vinyl polymers based on said esters. B 695,748, Cl. 260-31.8HA.
Moen, George E.; and De Vito, Vincent P. Microwave furnace. B 818,384, Cl. 219-10.55R.
Moen, Lowell J.: *See*—
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., B 733,562, Cl. 428-565.000.
Moertel, George B., to Textron Inc. Slide fastener. 4,112,555, Cl. 24-205.13C.
Moffatt, Clinton D. Golf practice device. B 732,318, Cl. 273-185.00C.
Mohacsi, Ernest, to Hoffmann-La Roche Inc. 3-Phenoxymorphinans and derivatives thereof. B 811,233, Cl. 260-285.000.
Mohrmann, Karl Heinz: *See*—
Bauch, Helmut; Mohrmann, Karl Heinz; and Koppehele, Frithjof, B 795,706, Cl. 330-56.000.
Mojonnier Bros. Co.: *See*—
Mojonnier, Harry G.; and Skoli, Sigmund P., 4,112,828, Cl. 99-275.000.
Mojonnier, Harry G.; and Skoli, Sigmund P., to Mojonnier Bros. Co. Reflux deaeration system. 4,112,828, Cl. 99-275.000.
Moles, Jacques Claude Antoine: *See*—
Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, B 605,926, Cl. 204-180.00R.
Molins Limited: *See*—
Harrington, Timothy Cardell; and Arthur, Hugh MacDonald, B 744,880, Cl. 242-58.100.
Preston, Edward George; and Doerman, Eryk Stefan, 4,112,954, Cl. 131-21.00R.
Moller, Eike; Meng, Karl-August, deceased (by Meng, Ilse Heide Frieda, heir); Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, to Bayer Aktiengesellschaft. 1-Substituted pyrazoles. B 693,971, Cl. 548-377.000.
Moller, Eike; Meng, Karl, deceased (by Meng, Ilse Heide Frieda, heiress); Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, to Baker Aktiengesellshaft. 4-Substituted pyrazoles. B 766,235, Cl. 424-273.00P.
Moller, Paul S., to Discojet Corporation. Engine muffler and spark arrester. B 728,913, Cl. 181-231.000.
Moller, Siegfried: *See*—
Rones, Josef; Moller, Siegfried; and Hoch, Helmut, B 781,820, Cl. 106-14.130.
Mongiello, Angelo. Cheese processing system. 4,112,835, Cl. 99-455.000.

Monroe Auto Equipment Company: *See—*
Palmer, Dale A., B 829,954, Cl. 188-282.000.
Monsanto Company: *See—*
Chapman, Richard D.; Holmer, Donald A.; and Mortimer, George A., B 759,313, Cl. 528-313.000.
Culbertson, Harry M., B 758,370, Cl. 528-138.000.
MacLean, Donald L.; and Estes, Robert T., B 699,543, Cl. 528-289.000.
Moran, James R., B 612,614, Cl. 260-876.00R.
Schumacher, Ignatius; and White, James E., B 734,893, Cl. 203-8.000.
Monsanto Company, St. Louis, Missouri: *See—*
Spiller, Herbert A., 4,112,668, Cl. 57-157.00S.
Montecatini Edison S.p.A.: *See—*
Mayr, Adolfo; Davoli, Velmore; Leccese, Antonio; and Susa, Ermanno, B 733,709, Cl. 252-429.00C.
Montedison S.p.A.: *See—*
Alneri, Enzo; Bottaccio, Giorgio; Campolmi, Stefano; and Cassar, Luigi, B 816,919, Cl. 568-716.000.
Matteoli, Mario; and Luciani, Luciano, B 755,503, Cl. 260-878.00B.
Modena, Mario; Massardo, Pietro; and Castelnuovo, Lucio, B 695,748, Cl. 260-31.8HA.
Padovan, Mario; De Alberti, Giordano; Battiston, Giancarlo; and Covini, Romano, B 734,248, Cl. 562-534.000.
Moon, Malcolm W.; and Kornis, Gabriel, to Upjohn Company, The. Furyl pyrazole amides. B 846,158, Cl. 548-374.000.
Moon, Malcolm W.; and Kornis, Gabriel, to Upjohn Company, The. Thienyl pyrazole amides. B 846,159, Cl. 548-374.000.
Moore Business Forms, Inc.: *See—*
Halse, Per Weien, B 821,223, Cl. 282-11.50A.
Moran, James R., to Monsanto Company. Transparent ABS polyblends. B 612,614, Cl. 260-876.00R.
Morcom, Paul J. Plastic collapsible article carrier. B 667,679, Cl. 206-174.000.
Morgan, James E., to Morgan Schaffer Corporation. Transformer fault detection. 4,112,737, Cl. 73-23.000.
Morgan Schaffer Corporation: *See—*
Morgan, James E., 4,112,737, Cl. 73-23.000.
Morgan, William H., Jr.: *See—*
Bonazoli, Robert P.; and Morgan, William H., Jr., B 812,916, Cl. 431-93.000.
Morgenstern, Manfred: *See—*
Spengler, Hans; Bucksch, Gunter; and Morgenstern, Manfred, B 704,600, Cl. 526-64.000.
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, to Kuraray Co., Ltd. Process for preparation of substituted cyclopropane carboxylic acids and esters thereof and intermediates of said acids and esters. B 616,998, Cl. 560-124.000.
Mori, Fumio: *See—*
Hotta, Hisashi; and Mori, Fumio, B 808,301, Cl. 156-306.000.
Mori, Kouichi: *See—*
Iwata, Toshiharu; Hattori, Tadashi; Mori, Kouichi; and Akiyama, Tomojiro, 4,112,885, Cl. 123-98.000.
Mori, Mamoru: *See—*
Arai, Hiroshi; and Mori, Mamoru, B 765,392, Cl. 280-747.000.
Mori, Shigeo; and Fujita, Takeshi, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Flame resistant polyurethane foam and process for producing the same. B 616,722, Cl. 521-163.000.
Mori, Toshio: *See—*
Kojimoto, Susumu; Sato, Takami; and Mori, Toshio, B 723,977, Cl. 264-89.000.
Morihashi, Toshihumi, to Murata Kikai Kabushiki Kaisha. Spinning apparatus for spun yarn. 4,112,658, Cl. 57-51.000.
Morikawa, Michio: *See—*
Hayashi, Torahiko; Kageyama, Minoru; and Morikawa, Michio, B 665,326, Cl. 264-173.000.
Morozumi, Shinji, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece. 4,112,670, Cl. 58-23.00A.
Morsani, Rosemary; and Nelson, Edwin G. Grow-pot. 4,112,619, Cl. 47-66.000.
Mortimer, George A.: *See—*
Chapman, Richard D.; Holmer, Donald A.; and Mortimer, George A., B 759,313, Cl. 528-313.000.
Morton-Norwich Products. Inc.: *See—*
Schwan, Thomas J., B 783,811, Cl. 260-345.500.
Mosch, Franz: *See—*
Deiner, Hans; Mosch, Franz; and Bernheim, Willy, B 554,819, Cl. 544-196.000.
Moses, John A. Laryngoscope of the straight blade type. 4,112,933, Cl. 128-11.000.
Mosler Safe Company, The: *See—*
Slater, Charles E.; Dunn, Paul E.; and Mustain, Lewis B., B 722,741, Cl. 235-419.000.
Mossner, Elmer H.: *See—*
Langhorst, Martin A.; Sinke, Gerard C.; and Mossner, Elmer H., B 746,981, Cl. 75-101.00R.
Mostert, Johann: *See—*
Greven, Johann; and Mostert, Johann, 4,112,730, Cl. 72-290.000.
Motoki, Jinro: *See—*
Kato, Yoshiaki; and Motoki, Jinro, 4,112,671, Cl. 58-23.00D.
Motorola, Inc.: *See—*
Brewster, Franklin Crawford, B 706,670, Cl. 308-26.000.
Derdzinski, Terrence Edmund; and Karlin, James Hilliard, B 620,987, Cl. 312-198.000.
Duncan, Herbert Alan, B 810,215, Cl. 325-480.000.
Feder, Alvin, B 800,245, Cl. 200-16.00R.
Schafft, Hugo Willy, B 756,216, Cl. 350-150.000.
Motte, Raymond: *See—*
Casalis, Jean-Arnaud; Teil, Yves; and Motte, Raymond, B 713,371, Cl. 210-219.000.
Mould, Henry Manifold: *See—*
Ford, Michael Alan; Mould, Henry Manifold; and Kolb, Dieter, B 757,204, Cl. 356-96.000.
Mowery, Richard A., Jr., to Phillips Petroleum Company. Step-wise gradient carrier for liquid chromatography. 4,112,743, Cl. 73-61.10C.
Moye, Helen Ione. Method of forming an animal-figure decoration. 4,112,573, Cl. 29-428.000.
Mucke, Rainer: *See—*
Andrascheck, Hans-Joachim; and Mucke, Rainer, B 721,276, Cl. 260-28.50D.
Mueller, David Charles, to American Can Company. Score line configuration for ice cream cartons and the like. B 840,739, Cl. 206-611.000.
Mueller, Loren H. Agricultural sorting and packing apparatus. B 736,560, Cl. 209-705.000.
Mueller, Robert C.: *See—*
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., B 733,562, Cl. 428-565.000.
Mueller-Tamm, Heinz: *See—*
Schweier, Gunther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, B 762,858, Cl. 526-124.000.
Muhlegg, Kurt, to Heberlein Maschinenfabrik AG. Friction false-twist device. 4,112,664, Cl. 57-77.400.
Muir, David Michael: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, B 686,496, Cl. 423-512.00A.
Mukaemachi, Takuji; Takeshita, Tetsuo; and Enami, Shiroh, to Hitachi, Ltd. Speech path packaging unit including controller containing shift register. B 775,619, Cl. 179-18.0ES.
Mukai, Kiyohisa: *See—*
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.
Mukai, Kunio: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, B 768,875, Cl. 424-225.000.
Mulaskey, Bernard F., to Chevron Research Company. Method of removing sulfur-containing impurities from hydrocarbons. B 727,488, Cl. 208-244.000.
Muller, Franz, to August Lepper, Maschinen- und Apparatebau GmbH. Combined drum washer and drying arrangement. 4,112,590, Cl. 34-75.000.
Muller, Friedhelm: *See—*
Sackmann, Gunter; Hendricks, Udo-Winfried; Honig, Hans-Ludwig; Kolb, Gunter; and Muller, Friedhelm, B 749,455, Cl. 106-238.000.
Muller, Hans; and Hanke, Georg, to Volkswagenwerk Aktiengesellschaft. Stay. B 746,101, Cl. 188-282.000.
Muller, Herbert: *See—*
Huber, Leonhard; Kirschner, Helmut; and Muller, Herbert, B 763,684, Cl. 354-252.000.
Muller, Johann, to Albert Handtmann, Firma. Method of and apparatus for making link sausages. 4,112,546, Cl. 17-49.000.
Muller, Lothar: *See—*
Raasch, Hans; and Muller, Lothar, B 633,707, Cl. 242-18.00R.
Muller, Wolf-Rudiger: *See—*
Sekoulov, Ivan; and Muller, Wolf-Rudiger, B 771,958, Cl. 210-17.000.
Sekoulov, Ivan; and Muller, Wolf-Rudiger, B 771,959, Cl. 210-17.000.
Mullin, Therese A.: *See—*
Andrews, Jeffrey F.; Mullin, Therese A.; and Senkus, Raymond, B 758,342, Cl. 424-81.000.
Mullins, Max. Compatible gear system. 4,112,782, Cl. 74-462.000.
Mullritter, Ludwig: *See—*
Eppe, Rudolf; Schnall, Gunther; Mullritter, Ludwig; Beck, Johann; and Hartwig, Karl, B 699,341, Cl. 355-8.000.
Mumford, Richard G.: *See—*
Hanway, John E., Jr.; and Mumford, Richard G., B 507,290, Cl. 423-242.000.
Muntjanoff, John R., to Caterpillar Tractor Co. Movable arch structure for skidder vehicle. B 554,936, Cl. 214-147.00G.
Murakami, Kazuyoshi: *See—*
Kawabe, Takamasa; Kadoma, Masaaki; Murakami, Kazuyoshi; and Itoh, Hatuhide, B 748,473, Cl. 260-348.220.
Murakami, Masuo: *See—*
Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, B 686,154, Cl. 424-317.000.
Murakami, Ryoichi: *See—*
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, B 791,470, Cl. 148-6.15R.
Murakami, Sakae, to Nippon Hoist Co., Ltd. Hook device. 4,112,750, Cl. 73-141.0AB.

Muramori, Kiyoshi: *See*—
Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, B 720,502, Cl. 209-1.000.

Murashige, Masayuki: *See*—
Sekihara, Takeshi; Emura, Tomoyuki; and Murashige, Masayuki, B 874,748, Cl. 526-74.000.

Murata, Hikaru, to Kayabakogyokabushikikaisha. Pressure responsive sequencing device. 4,112,822, Cl. 91-29.000.

Murata, Hikaru, to Kayabakogyokabushikikaisha. Pressure-reducing device. 4,112,825, Cl. 91-447.000.

Murata Kikai Kabushiki Kaisha: *See*—
Morihashi, Toshihumi, 4,112,658, Cl. 57-51.000.

Murata Manufacturing Co., Ltd.: *See*—
Nakatsu, Yoshiyuki; and Nishizawa, Hideo, B 768,618, Cl. 338-162.000.

Murata, Tomoji; and Shibazaki, Kenji, to Minolta Camera Kabushiki Kaisha. Power regulating device for controlling exposing means and fixing means in electrophotographic copying apparatus. B 740,725, Cl. 355-14.000.

Murata, Tomoji: *See*—
Nakamura, Yoshihiro; Shibazaki, Kenji; Kono, Tateomi; Inagaki, Syotaro; and Murata, Tomoji, B 736,189, Cl. 355-14.000.

Murphy, Edward J.: *See*—
Rabi, Rafat T.; Murphy, Edward J.; and Basoms, John A., B 745,240, Cl. 204-181.00C.

Musikindustriell Forskning MIFO AB: *See*—
Sjostrand, Gunnar; and Sjostrand, Staffan, 4,112,809, Cl. 84-465.000.

Musil, Josef: *See*—
Linkies, Adolf; Reuschling, Dieter-Bernd; Kuhlein, Klaus; Beck, Gerhard; and Musil, Josef, B 751,173, Cl. 424-274.000.

Muskus, Meryl L., to Raymond Lee Organization, Inc., The, a part interest. Method of making a cord hammock. 4,112,816, Cl. 87-12.000.

Mustain, Lewis B.: *See*—
Slater, Charles E.; Dunn, Paul E.; and Mustain, Lewis B., B 722,741, Cl. 235-419.000.

Muthenthaller, Gustav, to Kores S.p.A. Stapler. B 823,963, Cl. 227-124.000.

Mutt, Viktor: *See*—
Said, Sami I.; and Mutt, Viktor, B 649,968, Cl. 260-112.00R.

Myers, Lester L., to Mobile Aerial Towers, Inc. Fluid control system for mobile aerial towers. B 783,938, Cl. 182-2.000.

Nagaoka, Kazuya: *See*—
Matsuura, Ryo; Nakatani, Shuichi; Nagaoka, Kazuya; and Hioki, Katsuhiko, B 818,761, Cl. 260-351.000.

Nagaoka, Masaaki: *See*—
Komiyama, Yoshiro; Kondo, Katsumi; Koyama, Mototsugu; Nagaoka, Masaaki; and Uchida, Tsuneo, B 781,408, Cl. 228-176.000.

Nagashima, Hideo: *See*—
Suzuki, Hiroshige; Horie, Eizi; and Nagashima, Hideo, 4,112,648, Cl. 52-508.000.

Nagata, Nobuyoshi; and Mizuguchi, Ryuzo, to Nippon Paint Co., Ltd. Coating composition containing resin having tertiary aliphatic group and reactive hydroxyl group, process for its preparation and article coated with the composition. B 699,025, Cl. 260-29.4UA.

Nagy, Sandor: *See*—
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.

Nakada, Tetsuro; Shimizu, Makoto; and Yoshinaga, Mayumi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha; and Sumitomo Metal Industries, Ltd. Apparatus for cooling slag. B 864,252, Cl. 266-137.000.

Nakagawa, Jihei, to Olympus Optical Co., Ltd. Retrofocus type wide-angle photographic lens system. B 629,606, Cl. 350-216.000.

Nakagawa, Tadashi: *See*—
Onda, Eiichi; Watanabe, Masanori; Nakagawa, Tadashi; Nemoto, Ichiro; and Koyama, Mitsuo, B 766,745, Cl. 354-249.000.

Nakaguti, Osamu: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, B 640,910, Cl. 544-16.000.

Nakaji, Hideki: *See*—
Okunishi, Hiromu; Nakaji, Hideki; Suwa, Hiroyuki; and Sato, Hideaki, 4,112,732, Cl. 72-334.000.

Nakajima, Yoshikage: *See*—
Igarashi, Toshiji; and Nakajima, Yoshikage, B 821,910, Cl. 424-266.000.

Nakamura, Kantaro: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.

Nakamura, Soichi, to Nippon Kogaku K. K. Telephoto lens system. B 638,708, Cl. 350-212.000.

Nakamura, Yoshihiro; Shibazaki, Kenji; Kono, Tateomi; Inagaki, Syotaro; and Murata, Tomoji, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus. B 736,189, Cl. 355-14.000.

Nakanishi, Atsuo: *See*—
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, B 812,737, Cl. 260-874.000.

Nakano, Harumi, to Casio Computer Co., Ltd. Liquid crystal display device. B 654,725, Cl. 350-332.000.

Nakaoka, Azuma: *See*—
Koseki, Yasuo; Takahashi, Sankichi; and Nakaoka, Azuma, B 748,762, Cl. 210-82.000.

Nakaoka, Kazuhide; Araki, Kenzi; Nishimoto, Akihiko; Iwase, Kozi; and Kubotera, Haruo, to Nippon Kokan Kabushiki Kaisha. Method of making cold-reduced Al-killed steel strip for press-forming by continuous casting and continuous annealing process. B 713,793, Cl. 148-2.000.

Nakashima, Toshihiko: *See*—
Teranishi, Takanori; and Nakashima, Toshihiko, B 788,429, Cl. 318-421.000.

Nakatani, Shuichi: *See*—
Matsuura, Ryo; Nakatani, Shuichi; Nagaoka, Kazuya; and Hioki, Katsuhiko, B 818,761, Cl. 260-351.000.

Nakatsu, Yoshiyuki; and Nishizawa, Hideo, to Murata Manufacturing Co., Ltd. Variable resistor. B 768,618, Cl. 338-162.000.

Nakazato, Masao: *See*—
Yoneda, Kenji; Nakazato, Masao; and Yuminaka, Takeo, B 702,145, Cl. 187-29.00R.

Nanthavong, Souli: *See*—
Pigerol, Charles; de Cointet de Fillain, Paul; and Nanthavong, Souli, B 667,557, Cl. 260-326.160.

Narita, Hirosi: *See*—
Uchida, Kuniki; Araki, Kenzi; Narita, Hirosi; Fukunaka, Shiro; and Kurihara, Takao, B 776,288, Cl. 148-12.300.

Naslund, Rolf Paul: *See*—
Margen, Peter Heinrich Erwin; and Naslund, Rolf Paul, 4,112,569, Cl. 29-157.30R.

National Fluoride and Chemical Corporation: *See*—
Orth, George Otto, Jr.; and Orth, Richard D., B 618,958, Cl. 423-119.000.

National Gypsum Company: *See*—
O'Connor, Francis J., B 737,152, Cl. 423-171.000.

National Research Development Corporation: *See*—
Barlow, Harold Everard Monteagle, B 755,844, Cl. 333-95.00R.
Carter, Michael Charles; and Steer, Philip James, B 757,024, Cl. 364-415.000.
Gates, John William Charles; Hall, Roy Geoffrey Noel; Ross, Ian Norman; and Stevens, Richard Frederick, B 700,037, Cl. 356-110.000.

National Semiconductor Corporation: *See*—
Ross, John P.; and Bernardi, Carl E., B 776,162, Cl. 204-15.000.

National Starch and Chemical Corporation: *See*—
Pastor, Stephen D.; and Grover, Martin M., B 808,101, Cl. 260-834.000.

National Steel Corporation: *See*—
Manda, John G.; Burroughs, Joe D.; and Cairns, Donald F., B 647,937, Cl. 202-227.000.

Naylor Brothers (Clayware) Limited: *See*—
Widdicombe, Derek Gordon, 4,112,979, Cl. 138-89.000.

Nees, John; and Pike, Kenneth, to General Battery Corporation. Method of treating low antimony alloy battery grid material with phosphorus. B 734,311, Cl. 75-166.00C.

Nees, John; and Pike, Kenneth, to General Battery Corporation. Method of treating low antimony alloy battery grid material with phosphorus. B 768,960, Cl. 75-166.00C.

Negishi, Masaaki: *See*—
Watanabe, Haruo; and Negishi, Masaaki, B 697,192, Cl. 260-424.000.

Nehring, John R., to International Paper Company. Combined irrigator and evacuator for closed wounds. 4,112,947, Cl. 128-278.000.

Neidell, Norman S. Echo location systems. B 691,674, Cl. 343-9.000.

Neinast, Gary S., to Suntech, Inc. Pulling tool apparatus. B 714,208, Cl. 254-134.500.

Nelkin, Arthur; Skinner, Dale D.; Wilson, Donald G.; and Palmer, Harold D., to Westinghouse Electric Corp. Piezoelectric sediment particle transport detector. B 791,434, Cl. 310-334.000.

Nelson, Christian E. Barge-supported crane with hydraulically actuated ram corner lift means. 4,112,863, Cl. 114-264.000.

Nelson, Edwin G.: *See*—
Morsani, Rosemary; and Nelson, Edwin G., 4,112,619, Cl. 47-66.000.

Nelson, Karl L. Fastener holding attachment for a tool. 4,112,988, Cl. 145-50.00D.

Nelson, Larry L.: *See*—
DeHart, John R.; Nelson, Larry L.; and Krehl, William H., B 775,386, Cl. 209-549.000.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-ω-phenoxy-PGE analogs. B 822,305, Cl. 260-590.00C.

Nemoto, Ichiro: *See*—
Onda, Eiichi; Watanabe, Masanori; Nakagawa, Tadashi; Nemoto, Ichiro; and Koyama, Mitsuo, B 766,745, Cl. 354-249.000.

Neste Oy: *See*—
Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Koutroulos, Jean, B 768,494, Cl. 96-1.0PC.

New Concepts, Inc.: *See*—
Still, Robert C., 4,112,969, Cl. 137-454.200.

New Rochelle Manufacturing Co., Inc.: *See*—
Newman, Philip, 4,112,871, Cl. 119-18.000.

Newman, Philip, to New Rochelle Manufacturing Co., Inc. Bird cage feeder. 4,112,871, Cl. 119-18.000.

NHK Spring Co., Ltd.: *See*—
Takase, Hirobumi; and Utsunomiya, Yutaka, 4,112,721, Cl. 72-12.000.

Nicola, Charles: *See*—
Dayet, Jacques; Martin, Joseph; and Nicola, Charles, B 727,750, Cl. 200-148.00A.

Niederst, Kenneth W., to PPG Industries, Inc. Aqueous dispersions of esters stabilized with carbodiimides. B 801,673, Cl. 260-22.00T.

Niemann, Heinz, to ESGE-MARBY GmbH & Co. Luggage carrier for two-wheel vehicles, such as bicycles. B 776,421, Cl. 224-39.000.

Nifco Inc.: *See*—
Tanaka, Toshie, 4,112,815, Cl. 85-80.000.

Nikko Co., Ltd.: *See*—
Ishimoto, Zenichi, 4,112,615, Cl. 46-254.000.

Nikly, Jean, to Automobiles M. Berliet. Method and device for ensuring the tightness of a cylinderhead on the cylinder block of a thermal engine, in particular, a diesel engine. 4,112,907, Cl. 123-193.0CH.

Niksa, Gregory J.: *See*—
Rosenthal, Isadore; Exner, Lawrence J.; Niksa, Gregory J.; Weiss, Warren I.; and Young, Maurice G., 4,112,714, Cl. 68-206.000.

Nilson, Billy N., to KeNova AB. Safety valve. 4,112,971, Cl. 137-508.000.

Nimura, Takayasu, to Nippondenso Co., Ltd. Rotor for alternating current generator. B 781,003, Cl. 310-42.000.

Nippon Cable Systems Inc.: *See*—
Fukuda, Mataharu, 4,112,708, Cl. 64-2.00R.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Iyeta, Motoi, B 786,392, Cl. 274-23.00R.

Nippon Hoist Co., Ltd.: *See*—
Murakami, Sakae, 4,112,750, Cl. 73-141.0AB.

Nippon Hume Pipe Company Limited: *See*—
Iida, Hideo, B 715,493, Cl. 264-228.000.

Nippon Kogaku K. K.: *See*—
Kakizaki, Yukio, B 768,608, Cl. 248-430.000.
Nakamura, Soichi, B 638,708, Cl. 350-212.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Nakaoka, Kazuhide; Araki, Kenzi; Nishimoto, Akihiko; Iwase, Kozi; and Kubotera, Haruo, B 713,793, Cl. 148-2.000.
Uchida, Kuniki; Araki, Kenzi; Narita, Hirosi; Fukunaka, Shiro; and Kurihara, Takao, B 776,288, Cl. 148-12.300.

Nippon Oil Company Ltd.: *See*—
Shinomura, Toshihiko, B 639,166, Cl. 428-113.000.

Nippon Paint Co., Ltd.: *See*—
Nagata, Nobuyoshi; and Mizuguchi, Ryuzo, B 699,025, Cl. 260-29.4UA.
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, B 791,470, Cl. 148-6.15R.

Nippon Soken, Inc.: *See*—
Iwata, Toshiharu; Hattori, Tadashi; Mori, Kouichi; and Akiyama, Tomojiro, 4,112,885, Cl. 123-98.000.

Nippon Steel Corporation: *See*—
Sakurai, Toshio; Shimada, Shoji; and Kamimura, Yoshiharu, B 710,312, Cl. 252-49.600.

Nippon Telegraph and Telephone Public Corp.: *See*—
Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, B 626,098, Cl. 325-320.000.

Nippon Zeon Co. Ltd.: *See*—
Akiyama, Shinichi; and Yamamoto, Haruhisa, B 777,679, Cl. 562-532.000.

Nippondenso Co., Ltd.: *See*—
Akado, Hajime; Uchida, Yoshiro; Yamaguchi, Akihide; Nonoyama, Takao; Ootsubo, Suminobu; and Harada, Toshiro, 4,112,896, Cl. 123-122.00D.
Nimura, Takayasu, B 781,003, Cl. 310-42.000.
Nojiri, Tadao; Sugiura, Akio; and Nomura, Masahiro, B 756,699, Cl. 235-464.000.
Okamoto, Atutoshi; Nojiri, Tadao; and Nomura, Masahiro, B 765,753, Cl. 235-494.000.
Teranishi, Takanori; and Nakashima, Toshihiko, B 788,429, Cl. 318-421.000.
Uno, Eiichi; and Hachiga, Takasi, 4,112,904, Cl. 123-148.00E.

Nishida, Takashi: *See*—
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, B 616,998, Cl. 560-124.000.

Nishide, Hiroo; and Uehara, Yasuhiro, to Rank Xerox, Ltd. Heat roll fixing device for electrophotographic copying machine. B 801,678, Cl. 219-216.000.

Nishikawa, Masaji: *See*—
Kimura, Katsuhiko; and Nishikawa, Masaji, B 752,839, Cl. 355-3.0SC.

Nishimoto, Akihiko: *See*—
Nakaoka, Kazuhide; Araki, Kenzi; Nishimoto, Akihiko; Iwase, Kozi; and Kubotera, Haruo, B 713,793, Cl. 148-2.000.

Nishimura, Sanji: *See*—
Watanabe, Morio; and Nishimura, Sanji, B 773,657, Cl. 204-151.000.

Nishino, Atsushi: *See*—
Ookubo, Toshio; Nishino, Atsushi; and Suzuki, Tadashi, B 721,545, Cl. 422-177.000.

Nishizawa, Hideo: *See*—
Nakatsu, Yoshiyuki; and Nishizawa, Hideo, B 768,618, Cl. 338-162.000.

Nissan Motor Company, Limited: *See*—
Anzai, Makoto, 4,112,893, Cl. 123-119.0EC.
Asano, Masaharu; and Kadowaki, Shunichi, 4,112,880, Cl. 123-32.0EE.

Niwa, Takao: *See*—
Goto, Kenji; and Niwa, Takao, 4,112,877, Cl. 123-32.0ST.

Nnadi, John C.; and Heilweil, Israel J., to Mobil Oil Corporation. Multifunctional additives. B 564,954, Cl. 544-296.000.

Noack, Rolf; Schuster, Joachim; and Lohse, Udo, to Deutsche Babcock Aktiengesellschaft. Device for bending pipes. 4,112,728, Cl. 72-154.000.

Nogita, Shunsuke: *See*—
Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, B 720,502, Cl. 209-1.000.

Noguchi, Katsuyuki: *See*—
Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, B 793,920, Cl. 424-274.000.

Nohira, Hidetaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for recirculating exhaust gases. 4,112,894, Cl. 123-119.00A.

Nojiri, Shoji; Kanzaki, Hisao; Yasoshima, Nobuyuki; Satake, Yasuo; and Ogawa, Kenichi, to Fujitsu Limited. Signal sending control system. B 788,971, Cl. 179-84.00R.

Nojiri, Tadao; Sugiura, Akio; and Nomura, Masahiro, to Nippondenso Co., Ltd. Method and apparatus to optically recognize recorded information. B 756,699, Cl. 235-464.000.

Nojiri, Tadao: *See*—
Okamoto, Atutoshi; Nojiri, Tadao; and Nomura, Masahiro, B 765,753, Cl. 235-494.000.

Nolan, John T., Jr.: *See*—
Rao, Babu Y.; Nolan, John T., Jr.; and Estes, John H., B 774,099, Cl. 260-683.680.

Noll, Klaus-Reinhold: *See*—
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, B 812,325, Cl. 260-570.900.

Nomaki, Koji; and Saoyama, Yoshihito, to Asahi Glass Company, Ltd. Soldering apparatus. 4,112,868, Cl. 118-429.000.

Nomura, Masahiro: *See*—
Nojiri, Tadao; Sugiura, Akio; and Nomura, Masahiro, B 756,699, Cl. 235-464.000.
Okamoto, Atutoshi; Nojiri, Tadao; and Nomura, Masahiro, B 765,753, Cl. 235-494.000.

Nonoyama, Takao: *See*—
Akado, Hajime; Uchida, Yoshiro; Yamaguchi, Akihide; Nonoyama, Takao; Ootsubo, Suminobu; and Harada, Toshiro, 4,112,896, Cl. 123-122.00D.

Noo, Kunio: *See*—
Matsui, Takashi; Sugimura, Sadao; and Noo, Kunio, B 703,421, Cl. 264-230.000.

Nordica International, Inc.: *See*—
Conger, William H.; and Gehringer, Ronald F., 4,112,820, Cl. 70-363.000.

Nordin, Soren B.: *See*—
Nyren, Jan O.; Nordin, Soren B.; and Flodman, Leif A., B 761,209, Cl. 162-127.000.

Nordiska Maskinfilt Aktiebolaget: *See*—
Bugge, Hans Jorgen; Strandly, Ingvald; and Swanberg, Carl Olof, 4,112,982, Cl. 139-425.00A.

Norfield Corporation: *See*—
Beasley, Donald R., B 763,097, Cl. 428-116.000.

Norian, Roger F.: *See*—
Gorham, Michael L.; and Norian, Roger F., B 793,454, Cl. 179-90.00B.

Norris, Alan H.; and Chambley, Phillip W., to Champion International Corporation. Apparatus for manufacturing filaments of varying denier and actuating means therefor. 4,112,561, Cl. 28-243.000.

Nortec Inc.: *See*—
Sherwin, William Claude, B 731,558, Cl. 280-615.000.

North, Bernard: *See*—
Lumby, Roland John; North, Bernard; and Taylor, Alfred James, B 802,172, Cl. 106-73.400.

Northern Telecom Limited: *See*—
Pound, Thomas Charles; and Gouldson, Eric John, B 672,366, Cl. 156-56.000.
Westwood, William Dickson, B 797,509, Cl. 250-216.000.

Northwestern University: *See*—
Epstein, Max; Marhic, Michel E.; and Schacham, Samuel E., B 753,292, Cl. 331-94.50C.

Norton, Richard V., to Suntech, Inc. Process for cyanohydrin esters. B 776,452, Cl. 260-465.00D.

Nortronics Company, Inc.: *See*—
Kronfeld, Mervin B., B 734,363, Cl. 221-70.000.

Nosaka, Yoshinori: *See*—
Fukushima, Keitaro; Kusunose, Takamaro; and Nosaka, Yoshinori, B 719,504, Cl. 423-447.400.

Nosker, Richard William, to RCA Corporation. Smooth groove formation method employing spin coating of negative replica of inscribed disc. B 327,804, Cl. 427-140.000.

Nossen, Edward J., to United States of America, Army. Frequency synthesizer. B 856,448, Cl. 331-2.000.

Numair, Solomon J.: *See*—
Lonstrup, Thorkild F.; Brownawell, Darrell W.; Goletz, Edward, Jr.; and Numair, Solomon J., B 741,032, Cl. 252-51.50A.

Nyberg, David Dolph, to Raychem Corporation. Poly(tetramethyleneterephthalate) crosslinked by irradiation. B 856,500, Cl. 204-159.150.

Nygards, Nils. Water distiller of boiler-condenser type. B 661,252, Cl. 202-176.000.
Nyren, Jan O.; Nordin, Soren B.; and Flodman, Leif A., to Svenska Traforskningsinstitutet. Hard board or medium density board, process for production thereof and means for practicizing the process. B 761,209, Cl. 162-127.000.
O.P.O. Giken Kabushiki Kaisha: *See*—
Komatsu, Saburo, B 715,193, Cl. 335-258.000.
Oak Industries, Incorporated: *See*—
Desiderio, Angelo C., B 756,247, Cl. 200-246.000.
Oates, Robert M.; and Mackenzie, Raymond W., to Westinghouse Electric Corp. Rotor overtemperature protection for electric motors. B 783,525, Cl. 318-473.000.
Oberheiden, Helmut: *See*—
Huper, Fritz; and Oberheiden, Helmut, B 692,876, Cl. 544-20.000.
Obinata, Shiro; Hashimoto, Shigeru; and Sahara, Takeshi, to Dowa Mining Co., Ltd. Process of tin flotation. B 613,928, Cl. 209-167.000.
Oce-van der Grinten N.V.: *See*—
Extra, Piet M. J.; Smeets, Lambertus R. J. M.; Van Bavel, Adrianus W. M.; Van Lieshout, Jacobus J.; and Deckers, Albert T., 4,112,870, Cl. 118-657.000.
Ochii, Kiyofumi: *See*—
Suzuki, Yasoji; and Ochii, Kiyofumi, B 777,663, Cl. 365-189.000.
Ockers, Gerhardus: *See*—
Hoff, Siebe; Ockers, Gerhardus; Buitelaar, Arnold A.; and Van De Kraats, Eduard J., B 779,645, Cl. 44-66.000.
O'Connell, Joseph J., to Scientific Dimensions, Inc. Apparatus for removably mounting equipment to a vehicle. B 785,326, Cl. 248-221.300.
O'Connor, Francis J., to National Gypsum Company. Continuous gypsum calcination process and kettle therefor. B 737,152, Cl. 423-171.000.
O'Connor, Michael Niall Desmond: *See*—
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., B 706,087, Cl. 526-258.000.
Oda, Lorraine K.: *See*—
Oda, Roy N.; and Oda, Lorraine K., 4,112,833, Cl. 99-425.000.
Oda, Roy N.; and Oda, Lorraine K. Microwave cooking device. 4,112,833, Cl. 99-425.000.
Oderbolz, Fredy; and Bebie, Paul, to Ruti Machinery Works Ltd. Picking bands and drive arrangement for gripper weaving machine. 4,112,983, Cl. 139-446.000.
Oelke, Waldemar W.: *See*—
Boehm, Hans W.; Herrington, Richard A.; and Oelke, Waldemar W., B 767,051, Cl. 225-2.000.
Offermanns, Heribert: *See*—
Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, B 802,946, Cl. 260-545.00R.
Ogawa, Kenichi: *See*—
Nojiri, Shoji; Kanzaki, Hisao; Yasoshima, Nobuyuki; Satake, Yasuo; and Ogawa, Kenichi, B 788,971, Cl. 179-84.00R.
Ogawa, Taizo: *See*—
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, B 768,875, Cl. 424-225.000.
Ogisu, Kenji: *See*—
Tokumoto, Shin-Ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, B 801,640, Cl. 204-39.000.
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, B 802,487, Cl. 204-39.000.
Ohashi, Hiroshi: *See*—
Inoue, Hiromitsu; Ohashi, Hiroshi; and Katayama, Susumu, B 719,159, Cl. 340-558.000.
Ohuchi, Kenji: *See*—
Itoh, Tsutomu; Furuya, Nobuo; and Ohuchi, Kenji, 4,112,869, Cl. 118-623.000.
Ohzeki, Toshio: *See*—
Minagawa, Motonobu; Ohzeki, Toshio; and Sekiguchi, Tetsuo, B 806,521, Cl. 260-23.70M.
Oishi, Masaharu: *See*—
Kogure, Motoo; Komiya, Mamoru; Oishi, Masaharu; and Kanbe, Masaru, B 677,266, Cl. 428-412.000.
Oka, Shohei: *See*—
Fuse, Takeshi; Yajima, Toshio; Hino, Isao; and Oka, Shohei, B 761,278, Cl. 248-204.000.
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, to Nippon Paint Co., Ltd. Phosphating of metallic substrate with electrolytic reduction of nitrate ions. B 791,470, Cl. 148-6.15R.
Okabayashi, Keiichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing controller for a gasoline engine. 4,112,888, Cl. 123-117.00A.
Okamoto, Atutoshi; Nojiri, Tadao; and Nomura, Masahiro, to Nippondenso Co., Ltd. Bar code information card. B 765,753, Cl. 235-494.000.
Okano, Masao, to Toyo Valve Company, Ltd. Copper alloys of excellent corrosion resistance, moldability and workability. B 698,800, Cl. 75-156.500.
Okazaki, Hiroshi: *See*—
Okumura, Tomisaburo; Okazaki, Hiroshi; Tsuchitani, Akira; and Ueda, Seiji, B 763,679, Cl. 148-187.000.
Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, to Yamanouchi Pharmaceutical Co., Ltd. Stabilized oral prostaglandin formulation and the process for the preparation thereof. B 686,154, Cl. 424-317.000.
Oki Electric Industry Co., Ltd.: *See*—
Isobe, Minoru, B 691,200, Cl. 206-388.000.
Okita, Koichi, to Sumitomo Electric Industries, Ltd. Hydrophilic porous structures and process for production thereof. B 823,474, Cl. 428-290.000.
Oku, Teruo: *See*—
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, B 640,910, Cl. 544-16.000.
Okubo, Hiroyuki: *See*—
Yoshizawa, Isamu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, 4,112,798, Cl. 83-344.000.
Okubo, Toshio: *See*—
Saiki, Atsushi; Okubo, Toshio; and Harada, Seiki, B 695,040, Cl. 156-656.000.
Okuda, Hiroji; and Harada, Shigenori, to Koyo Seiko Company Limited. Drive shaft for rolling mills and the like. 4,112,710, Cl. 64-23.000.
Okumura, Tomisaburo; Okazaki, Hiroshi; Tsuchitani, Akira; and Ueda, Seiji, to Matsushita Electronics Corporation. Method of making a MOS device. B 763,679, Cl. 148-187.000.
Okunishi, Hiromu; Nakaji, Hideki; Suwa, Hiroyuki; and Sato, Hideaki, to Honda Giken Kogyo Kabushiki Kaisha. Method and apparatus for shaping integrally-shaped type brake disks for cars. 4,112,732, Cl. 72-334.000.
Okuno, Yositosi: *See*—
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, B 768,875, Cl. 424-225.000.
Okutsu, Eiichi: *See*—
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, B 231,001, Cl. 96-60.00R.
Olbrich, Gottfried; and Weigert, Wilhelm, to Robert Bosch GmbH. Valve for an opening of a pressure vessel. 4,112,978, Cl. 138-30.000.
Olin Corporation: *See*—
Turley, Richard J.; and Ozolins, Alexandre, B 807,456, Cl. 156-330.000.
Oliver, Colin Charles, to EMI Limited. Radiography. B 765,422, Cl. 250-445.00T.
Ollivier, Jean: *See*—
Combette, Marc; Dorgnon, Roger; Luthringer, Jean; and Ollivier, Jean, B 805,663, Cl. 227-10.000.
Combette, Marc; and Ollivier, Jean, 4,112,685, Cl. 60-634.000.
Olmstead, John Aaron: *See*—
Ponczak, Samuel; and Olmstead, John Aaron, B 763,721, Cl. 148-1.500.
Olmstead, William Dean, to Cycle-Kamp Inc. Compact tent-type camping trailer. B 735,429, Cl. 296-23.00H.
Olsson, Erik A. Method of and apparatus for converting molten metal into solidified products. B 700,080, Cl. 228-170.000.
Olympus Optical Co., Ltd.: *See*—
Kimura, Katsuhiko; and Nishikawa, Masaji, B 752,839, Cl. 355-3.0SC.
Matsubara, Masaki, B 788,961, Cl. 350-186.000.
Nakagawa, Jihei, B 629,606, Cl. 350-216.000.
Yamasita, Nobuo; and Imai, Toshihiro, B 773,408, Cl. 350-172.000.
Omura, Yoshiaki: *See*—
Mori, Fumio; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, B 616,998, Cl. 560-124.000.
Onda, Eiichi; Watanabe, Masanori; Nakagawa, Tadashi; Nemoto, Ichiro; and Koyama, Mitsuo, to Seiko Koki Kabushiki Kaisha. Shutter opening and closing mechanism for cameras. B 766,745, Cl. 354-249.000.
Ondetti, Miguel Angel; and Condon, Michael Edward, to E. R. Squibb & Sons, Inc. Amino acid derivatives. B 759,685, Cl. 260-112.50R.
Onnen, William G.: *See*—
Hill, Robert W.; Onnen, William G.; and Ryder, Lyle C., B 719,696, Cl. 264-262.000.
Onoda Cement Co., Ltd.: *See*—
Itoh, Tsutomu; Furuya, Nobuo; and Ohuchi, Kenji, 4,112,869, Cl. 118-623.000.
Ooishi, Tadashi: *See*—
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, B 768,875, Cl. 424-225.000.
Ookubo, Toshio; Nishino, Atsushi; and Suzuki, Tadashi, to Matsushita Electric Industrial Co., Ltd. Cooking apparatus employing a purging device. B 721,545, Cl. 422-177.000.
Oomura, Takao: *See*—
Funakoshi, Satoshi; and Oomura, Takao, B 813,419, Cl. 424-78.000.
Ootsubo, Suminobu: *See*—
Akado, Hajime; Uchida, Yoshiro; Yamaguchi, Akihide; Nonoyama, Takao; Ootsubo, Suminobu; and Harada, Toshiro, 4,112,896, Cl. 123-122.00D.
Opgenorth, Hans-Joachim; and Scheuermann, Horst, to BASF Aktiengesellschaft. Manufacture of benzothiazoles. B 810,950, Cl. 260-305.000.
Opitz, Konrad: *See*—
Kruse, Hubert; and Opitz, Konrad, B 690,023, Cl. 8-90.000.
Ore-Ida Foods, Inc.: *See*—
Covington, Wayne L.; and Green, Glen R., 4,112,545, Cl. 17-45.000.
Orrville Products, Inc.: *See*—
Featherstone, Harry Edwin; and Sniff, Walter Grant, Jr., B 809,911, Cl. 219-137.00R.

Orth, Dieter: *See*—
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, B 739,142, Cl. 424-205.000.

Orth, George Otto, Jr.; and Orth, Richard D., to National Fluoride and Chemical Corporation. Recovery of sodium fluoride and other chemicals from spent carbon liners. B 618,958, Cl. 423-119.000.

Orth, Richard D.: *See*—
Orth, George Otto, Jr.; and Orth, Richard D., B 618,958, Cl. 423-119.000.

Orzales, Henri-Ange, to Societe Civile de Recherches et d'Etudes Nouvelles. 3-(4'-Alkoxy-benzoyl)-1,2,2-trimethyl-cyclopentane-carboxylic acids, their optical isomers and drugs containing such compounds. B 705,535, Cl. 560-52.000.

Osaka Prefectural Office: *See*—
Fuse, Takeshi; Yajima, Toshio; Hino, Isao; and Oka, Shohei, B 761,278, Cl. 248-204.000.

Osaka Soda Co., Ltd.: *See*—
Kawabe, Takamasa; Kadoma, Masaaki; Murakami, Kazuyoshi; and Itoh, Hatuhide, B 748,473, Cl. 260-348.220.

Osanai, Shinichi, to Labogiken Co., Ltd. Apparatus for withdrawing the tongue of a film incorporated in a cartridge. B 838,059, Cl. 242-1.000.

Osawa, Mitsuo: *See*—
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, B 798,313, Cl. 274-15.00R.

Oshima, Kathuhide; Takasaki, Haruyuki; and Takahashi, Akio, to Dipsol Chemical Company, Ltd. Method for brightening the electrodeposits of zinc from alkaline zinc electroplating baths. B 779,560, Cl. 204-55.00Y.

Oshio, Hiromichi; Konishi, Hiroyuki; Matsumura, Shiunzi; Ishikawa, Kikuichi; and Yoneyama, Eiichi, to Sumitomo Chemical Company, Limited. Method for controlling the growth of plants. B 776,618, Cl. 71-76.000.

Osterburg, Gunther: *See*—
Strehlke, Gunter; and Osterburg, Gunther, B 547,846, Cl. 260-593.00P.

Ostergaard, Steen. Dispenser for ground coffee and other powdered products. B 754,696, Cl. 222-243.000.

O'Toole, Jerome M.; and Paquette, Edmund T., to Wright Line Inc. Holder for documentation cartridge. B 832,729, Cl. 312-184.000.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See*—
Shimizu, Junichi; Hara, Takashi; Iwakura, Tatsuya; and Itaya, Yoshiro, B 717,322, Cl. 426-602.000.

Otsuka Nutrition Research Institute Inc.: *See*—
Ando, Sumio, B 661,077, Cl. 417-502.000.

Ott, Hans, to Meteor AG. Soldering apparatus. B 835,032, Cl. 228-36.000.

Ott, Karl-Heinz: *See*—
Bischoff, Jurgen; Kowitz, Friedrich; Ott, Karl-Heinz; Schuster, Herbert; Rohr, Harry; and Weitzel, Hans, B 400,980, Cl. 260-876.00R.

Ott, Robert B.; and Heringer, Lawrence R., to Hennegan Company, The. Display panel assembly. 4,112,604, Cl. 40-610.000.

Otto, Jeffrey B.: *See*—
McGarry, Francis J.; Greene, Donald; and Otto, Jeffrey B., B 847,571, Cl. 162-123.000.

Otto, Wolfgang K. F., to Milliken Research Corporation. Method for modifying fibers of a fabric and the products so produced. B 799,620, Cl. 8-125.000.

Otto, Wolfgang K. F., to Milliken Research Corporation. Method for modifying fibers of a fabric and the products so produced. B 799,623, Cl. 8-115.500.

Oude Alink, Bernardus A., to Petrolite Corporation. Preparation of octahydrophenanthridines. B 812,888, Cl. 260-286.00A.

Ouellette, Joseph Fernand; and Pocling, David L., to Quellette Machinery Systems, Inc. Earthquake simulator. 4,112,776, Cl. 73-665.000.

Outboard Marine Corporation: *See*—
Fields, Ernest E.; and Reineck, Lester W., B 823,614, Cl. 220-367.000.
Hackbarth, Eugene R.; and Van Rens, Russell J., B 780,590, Cl. 261-52.000.

Outokumpu Oy: *See*—
Aaltonen, Olavi August; and Juusela, Jyrki Tapani, B 647,506, Cl. 75-74.000.

Outokumpu Oy, Ab.: *See*—
Leinonen, Erkki Ilmari; and Kiuru, Erkki Sakari, B 735,983, Cl. 323-17.000.

Owen, Wickersham & Erickson: *See*—
Lindberg, John E., 4,112,892, Cl. 123-119.00A.

Owens-Corning Fiberglas Corporation: *See*—
Stalego, Charles J., B 758,109, Cl. 65-11.00R.

Owens-Illinois, Inc.: *See*—
Ernsthausen, Roger E., B 293,817, Cl. 313-188.000.

Oxford Industries, Inc.: *See*—
Ellington, Gordon H.; Mitchell, William O.; and Estapa, Don E., 4,112,860, Cl. 112-262.000.

Oxy Metal Industries Corporation: *See*—
Rones, Josef; Moller, Siegfried; and Hoch, Helmut, B 781,820, Cl. 106-14.130.

Oya, Masashi: *See*—
Mizuno, Michitaka; Ideue, Kazuo; and Oya, Masashi, 4,112,759, Cl. 73-295.000.

Ozaki, Masaru: *See*—
Shiga, Tetsuo; Ozaki, Masaru; Arakawa, Tatsumi; and Kobayashi, Hidehiko, B 751,778, Cl. 96-114.100.

Ozaki, Toshiaki: *See*—
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, B 768,875, Cl. 424-225.000.

Ozaki, Tsutomu; and Hijikata, Setsuo, to Kubota, Ltd. Body weight measuring apparatus. B 712,952, Cl. 177-25.000.

Ozolins, Alexandre: *See*—
Turley, Richard J.; and Ozolins, Alexandre, B 807,456, Cl. 156-330.000.

P. D. George Company, The: *See*—
Lange, Daniel J., B 823,732, Cl. 528-289.000.

P. R. Mallory & Co. Inc.: *See*—
Klein, Gerhart P., B 769,369, Cl. 266-252.000.

Pachnik, Ben E. Radius router guide. 4,112,987, Cl. 144-323.000.

Padovan, Mario; De Alberti, Giordano; Battiston, Giancarlo; and Covini, Romano, to Montedison S.p.A. Process for preparing unsaturated carboxylic acids by gas phase catalytic oxidation of the corresponding aldehydes. B 734,248, Cl. 562-534.000.

Paginton, Philip Norman, to Westinghouse Brake & Signal Co. Ltd. Brake actuator. B 816,133, Cl. 188-196.00F.

Pako Corporation: *See*—
Diesch, Robert E., 4,112,801, Cl. 83-586.000.

Palfrey, Lesley Francis; and Fellows, Ronald John, to Thorn Domestic Appliances (Electrical) Ltd. Control system for drier. 4,112,589, Cl. 34-48.000.

Palkes, Mark, to Exxon Research & Engineering Co. Solar energy collector. 4,112,918, Cl. 126-270.000.

Palmer, Dale A., to Monroe Auto Equipment Company. Piston valve assembly for a shock absorber. B 829,954, Cl. 188-282.000.

Palmer, Harold D.: *See*—
Nelkin, Arthur; Skinner, Dale D.; Wilson, Donald G.; and Palmer, Harold D., B 791,434, Cl. 310-334.000.

Palmer, Jack P. Apparatus for driving wheeled vehicles. B 721,154, Cl. 180-33.00A.

Panetta, Anthony. Fire safety Christmas ornament. B 749,608, Cl. 169-26.000.

Panin, Vladlen Iosifovich: *See*—
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, B 702,208, Cl. 423-131.000.

Pankove, Jacques Isaac; and Marlowe, Frank Jerome, to RCA Corporation. Solid state oscilloscope. B 775,864, Cl. 324-121.00R.

Pankove, Jacques Isaac; and Lampert, Murray Alfred, to RCA Corporation. Method of passivating a semiconductor device by treatment with atomic hydrogen. B 869,641, Cl. 148-1.500.

Pantukh, Boris Izrailevich: *See*—
Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Sobolev, Valerian Mikhailovich; Rutman, Grigory Iosifovich; Logutov, Igor Jurievich; and Dolidze, Vladimir Romanovich, B 788,590, Cl. 568-789.000.

Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., to American Cyanamid Company. Unsaturated imidazolines. B 706,087, Cl. 526-258.000.

Pap, Zsolt: *See*—
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.

Papenfuhs, Theodor; and Volk, Heinrich, to Hoechst Aktiengesellschaft. Metal-containing disazomethine compounds, process for preparing them and their use as colorants. B 799,001, Cl. 260-439.00R.

Paquette, Edmund T.: *See*—
O'Toole, Jerome M.; and Paquette, Edmund T., B 832,729, Cl. 312-184.000.

Paquette, Rolland. Adjustable door latch striker. B 778,693, Cl. 292-341.180.

Park-Ohio Industries, Inc.: *See*—
Lewis, John C., B 835,157, Cl. 219-10.410.

Parker, Adrian Roger, to Partech (Electronics) Limited. Photoelectric sensing head with wiping means. B 784,415, Cl. 250-239.000.

Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, to Anumin Pty. Limited. Method of producing solutions containing cuprous ions. B 686,496, Cl. 423-512.00A.

Parker-Hannifin Corporation: *See*—
Hoffman, Robert K.; and Franson, David C., 4,112,968, Cl. 137-427.000.

Parkes, Alvin E., to Raymond Lee Organization, Inc., The, a part interest. Scavenging valve device. 4,112,940, Cl. 128-188.000.

Parkhitko, Vladimir Mikhailovich: *See*—
Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich, 4,112,702, Cl. 62-123.000.

Parks-Cramer Company: *See—*
Werst, Lyman L., 4,112,665, Cl. 57-81.000.
Parsons, Bruce B.; and Wolfe, Denis G., to Robertshaw Controls Company. Thermally responsive actuator. B 758,036, Cl. 337-387.000.
Partech (Electronics) Limited: *See—*
Parker, Adrian Roger, B 784,415, Cl. 250-239.000.
Parton, Brian, to Imperial Chemical Industries Limited. Quaternized azo dyestuffs. B 648,568, Cl. 260-146.00R.
Pasinski, Ralph R. Multiple operation traverse apparatus and methods of constructing and utilizing same. 4,112,995, Cl. 160-126.000.
Pastor, Stephen D.; and Grover, Martin M., to National Starch and Chemical Corporation. Pressure sensitive adhesive compositions. B 808,101, Cl. 260-834.000.
Patel, Gordhan M.: *See—*
Collin, Alvaro L.; and Patel, Gordhan M., 4,112,693, Cl. 405-132.000.
Patella, Ralph F.; and Kuzma, Edward J., to Celanese Corporation. Use of multifunctional monomers in the preparations of emulsions to be used in adhesives. B 856,829, Cl. 156-327.000.
Patellis, Anargiros Pete: *See—*
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., B 636,340, Cl. 260-876.00B.
Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen m.b.H.: *See—*
Wiedenmann, Hans, B 805,368, Cl. 313-315.000.
Paterson, Thomas: *See—*
Wood, Hamish Christopher Swan; and Paterson, Thomas, B 335,102, Cl. 424-180.000.
Patterson, George: *See—*
Putman, Edgar N.; Patterson, George; Wimer, Scotty; and McCool, John B., 3rd, B 601,628, Cl. 252-363.500.
Patterson, James A. Water level controller for swimming pool gutter. 4,112,526, Cl. 4-172.170.
Patton, Ray F.: *See—*
Fono, Andrew; and Patton, Ray F., B 680,198, Cl. 8-34.000.
Pauchard, Jean-Paul: *See—*
Siegrist, Adolf Emil; and Pauchard, Jean-Paul, B 850,861, Cl. 542-463.000.
Paulnack, Carl Lewis: *See—*
Katz, Lewis Emanuel; and Paulnack, Carl Lewis, B 853,126, Cl. 156-612.000.
Pautsch, Gunthard; and Kohlstette, Werner, to Westfalia Separator Aktiengesellschaft. Centrifuge whose drum casing is continuously cooled by a coolant circulated within an insert disposed in the solids chamber. B 811,421, Cl. 233-11.000.
Pawsat, Carlton P.; and Humlong, Robert F., to Wald Manufacturing Company, Inc. Bicycle stem and fork tube assembly. B 782,662, Cl. 403-22.000.
PCR, Inc.: *See—*
Schuman, Paul D.; Tarrant, Paul; Warner, Dale A.; and Westmoreland, Geraldine, B 665,865, Cl. 544-303.000.
Peanut Research & Testing Laboratories, Inc.: *See—*
Baxley, James Russell, B 779,030, Cl. 426-509.000.
Pearl, David R., to Gerber Garment Technology, Inc. Fluid jet cutting apparatus. 4,112,797, Cl. 83-177.000.
Pearson, Stephen C., to Hercules Incorporated. Process for rapidly dissolving gels of water-soluble polymers by extrusion, cutting and then slurrying under high shearing forces. B 860,423, Cl. 260-29.6PM.
Pease, William Thomas, to Alproco, Inc. Level indicating instrument. 4,112,585, Cl. 33-388.000.
Peaster, Bertram Anthony, to Lockheed Corporation. Automatic lubricator. B 759,756, Cl. 184-41.000.
Pedain, Josef: *See—*
Bock, Manfred; Pedain, Josef; and Uerdingen, Walter, B 778,631, Cl. 260-859.00R.
Pejouhy, Radi, to Texas Instruments Incorporated. Current interrupting apparatus. B 728,350, Cl. 337-97.000.
Penberthy, H. Larry. Molten glass homogenizer. B 798,879, Cl. 65-178.000.
Pennwalt Corporation: *See—*
Hager, Robert Bonner; Toukan, Sameeh Said; and Walter, Gerald Joseph, B 459,132, Cl. 260-348.430.
Percy, Donald W., to Prelube Corporation. Pre-lube device. 4,112,910, Cl. 123-196.00S.
Perry, James E.: *See—*
Franks, Lawrence A.; Stroup, Steven L.; and Perry, James E., 4,112,794, Cl. 82-64.000.
Peterkin, Melvin E.: *See—*
Lauer, James L.; and Peterkin, Melvin E., B 791,089, Cl. 356-70.000.
Peters, Klaus-Jurgen: *See—*
Schwartz, Reinhard; Knapp, Heinrich; Riel, Klaus; and Peters, Klaus-Jurgen, 4,112,900, Cl. 123-139.0AW.
Peterson, Durey H.: *See—*
DeBoer, Clarence; Dolak, Lester A.; and Peterson, Durey H., B 834,285, Cl. 424-117.000.
Petrellis, Nicolas C.: *See—*
Sabol, Albert R.; and Petrellis, Nicolas C., B 773,346, Cl. 252-32.70E.
Petrick, Paul J., Sr., to Shooting Star Tennis. Ball collector and projector apparatus. 4,112,911, Cl. 124-56.000.
Petrie, Edward M., to Westinghouse Electric Corp. Low temperature cure epoxy-amine adhesive compositions. B 749,392, Cl. 260-29.2EP.
Petrolite Corporation: *See—*
Oude Alink, Bernardus A., B 812,888, Cl. 260-286.00A.
Quinlan, Patrick M., B 713,666, Cl. 424-78.000.
Pfaff Industriemaschinen GmbH: *See—*
Willenbacher, Erich, 4,112,859, Cl. 112-217.100.
PFD/Penn Color, Inc.: *See—*
Putman, Edgar N.; Patterson, George; Wimer, Scotty; and McCool, John B., 3rd, B 601,628, Cl. 252-363.500.
Pfister, Frieder: *See—*
Hafner, Hans Wilhelm; and Pfister, Frieder, 4,112,752, Cl. 73-147.000.
Pfister Waagen GmbH: *See—*
Hafner, Hans Wilhelm; and Pfister, Frieder, 4,112,752, Cl. 73-147.000.
Pfizer Inc.: *See—*
Barth, Wayne E., B 791,537, Cl. 544-23.000.
Hamsher, James J.; and Lozanov, Merrill, B 745,212, Cl. 195-36.00P.
Hess, Hans-Jurgen E., B 562,208, Cl. 562-503.000.
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., B 854,392, Cl. 260-347.300.
Pflasterer, Peter W., to Masco Corporation of Indiana. Crystalless scanning radio receiver. B 690,881, Cl. 325-470.000.
Phifer, Earl Cooper: *See—*
Howard, James Lynn, B 799,379, Cl. 324-66.000.
Philips Industries Inc.: *See—*
Bowker, Donald R.; Klein, Donald J.; and Rados, Stephen E., B 656,538, Cl. 264-295.000.
Phillips, Edwin R., to Sperry Rand Corporation. Edge vacuum guide for flexible members. B 486,245, Cl. 271-264.000.
Phillips, Howard W.: *See—*
Frazier, Albert A.; and Phillips, Howard W., B 837,519, Cl. 222-131.000.
Phillips, John F., Jr.: *See—*
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., B 779,038, Cl. 423-308.000.
Phillips Petroleum Company: *See—*
Bilings, William G., B 811,426, Cl. 260-607.0AR.
Dale, Glenn H., B 669,539, Cl. 203-62.000.
Doss, Richard C., B 794,893, Cl. 428-355.000.
Hatcher, Charles S.; and Smith, Kenneth E., 4,112,667, Cl. 57-157.00S.
Hitzman, Donald O., B 749,196, Cl. 166-303.000.
Louthan, Rector P.; and Doss, Richard C., B 737,948, Cl. 528-279.000.
Moczygemba, George A., B 711,029, Cl. 526-25.000.
Mowery, Richard A., Jr., 4,112,743, Cl. 73-61.10C.
Ragains, Wilbur G., 4,112,766, Cl. 73-422.0GC.
Stapp, Paul R., B 551,834, Cl. 560-246.000.
Stoller, Frederick L., B 723,394, Cl. 264-280.000.
Phillips, Reginald Andrew; Hamilton, Terence; and Thompson, Arthur David, to Dobson Park Industries Limited. Funneling machine with inclined advancing rams. B 734,637, Cl. 299-31.000.
Phinney, John M., to Falk Corporation, The. Marine propulsion control system with engine idle boost. B 759,390, Cl. 192-.098.
Picha, Donald A., to International Harvester Company. Rotary knife adjuster assembly. 4,112,654, Cl. 56-98.000.
Pickelman, Dale M., Sr.; and Wessling, Ritchie A., to Dow Chemical Company, The. Process for preparing substantially linear water-soluble interpolymeric interfacially spreading polyelectrolytes. B 776,167, Cl. 526-30.000.
Pickering & Company, Inc.: *See—*
Alexandrovich, George, B 790,391, Cl. 274-37.000.
Wittenberg, Roland C., B 790,397, Cl. 274-37.000.
Pickrell, John W. Container handling and transporting apparatus. B 770,398, Cl. 214-38.00D.
Pielkenrood, Jacob, to Pielkenrood-Vinitex B.V. Separation device provided with a coalescence apparatus. B 662,838, Cl. 210-522.000.
Pielkenrood-Vinitex B.V.: *See—*
Pielkenrood, Jacob, B 662,838, Cl. 210-522.000.
Pieper, Helmut: *See—*
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, B 812,325, Cl. 260-570.900.
Pierce, Donald, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Flexible aerofoils. B 781,866, Cl. 244-219.000.
Pierce, Donald Cameron. Device for cutting ovals in mats or glass sheets. 4,112,793, Cl. 82-1.300.
Pierce, Walker L., Jr.: *See—*
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., B 733,562, Cl. 428-565.000.
Pierre, Michel: *See—*
Lesas, Claude H.; and Pierre, Michel, B 731,895, Cl. 536-56.000.
Pieters, Wim J. M.; and Carlson, Emery J., to Allied Chemical Corporation. Catalyst of chlorination and combined chlorination/fluorination based on copper/calcium/fluoride. B 791,767, Cl. 252-438.000.
Pietrusza, Arthur Jacob; and Kent, Harry James, to Dravo Corporation. Rotary scraper in a rotary drum assembly. B 709,427, Cl. 435-222.000.
Pigerol, Charles; de Cointet de Fillain, Paul; and Nanthavong, Souli, to S. A. Labaz. 2-Phenyl-indole derivatives. B 667,557, Cl. 260-326.160.
Pike, Harold L., to Aspen Laboratories. Medical electronic apparatus and components. 4,112,950, Cl. 128-303.140.
Pike, Kenneth: *See—*
Nees, John; and Pike, Kenneth, B 734,311, Cl. 75-166.00C.

Nees, John; and Pike, Kenneth, B 768,960, Cl. 75-166.00C.
Pilkington Brothers Limited: *See—*
Cross, Raymond Peter, B 849,632, Cl. 65-114.000.
Pillar, Walter O., to Arco Polymers, Inc. Molding expandable styrene polymer particles. B 848,972, Cl. 521-60.000.
Pillsbury, Paul W.; and DeCorso, Serafino M., to Westinghouse Electric Corp. Apparatus and method for starting a large gas turbine having a catalytic combustor. 4,112,675, Cl. 60-39.060.
Pine, Lloyd A.: *See—*
Riley, Kenneth L.; and Pine, Lloyd A., B 773,427, Cl. 252-439.000.
Pingry, Carl Oscar, III: *See—*
Boyd, William Weller; Grafe, Robert Joseph; and Pingry, Carl Oscar, III, B 762,376, Cl. 340-147.00R.
Pirlet, Robert Alfred, to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie. Inspecting the interior of an enclosure. 4,112,763, Cl. 73-355.00R.
Pitchford, Peter R. Metal pallet. 4,112,854, Cl. 108-56.100.
Pitfield, Adrian: *See—*
Thompson, John; and Pitfield, Adrian, B 662,266, Cl. 252-90.000.
Pitney-Bowes, Inc.: *See—*
Brana, George; and Russell, John J., B 840,305, Cl. 252-62.10P.
Storace, Anthony, B 807,393, Cl. 177-211.000.
Pittoors, Jan Gustaaf: *See—*
Goransson, Lars Roland; van Oorschot, Gosewinus Franciscus; and Pittoors, Jan Gustaaf, B 750,835, Cl. 55-97.000.
Plantard, Dominique: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, B 829,515, Cl. 65-5.000.
Plasteco, Inc.: *See—*
Sandow, Kiyoshi, 4,112,620, Cl. 49-8.000.
Platt Saco Lowell Limited: *See—*
Lappage, James; Doggett, Neil; and Yates, Stephen William, 4,112,662, Cl. 57-34.0AT.
Plattner, Werner, executor: *See—*
Stach, Kurt, deceased; Bosies, Elmar; Heerdt, Ruth; Kuhnle, Hans-Frieder; and Schmidt, Felix Helmut, B 674,993, Cl. 424-272.000.
Ploeger, Walter, Jr., to Filmon Process Corp. Printing ribbon. B 578,581, Cl. 400-240.100.
Poeling, David L.: *See—*
Ouellette, Joseph Fernand; and Poeling, David L., 4,112,776, Cl. 73-665.000.
Poinsard, Elisabeth Michele; and Poinsard, Robert Gaston, to Etablissement Valvin. Apparatus for purifying carbon dioxide vapors of fermenting liquids. 4,112,829, Cl. 99-277.000.
Poinsard, Robert Gaston: *See—*
Poinsard, Elisabeth Michele; and Poinsard, Robert Gaston, 4,112,829, Cl. 99-277.000.
Poisson, Bernard, to Regie Nationale des Usines Renault. Self-cleaning ejector-filter. B 787,514, Cl. 164-227.000.
Polak's Frutal Works, Inc.: *See—*
DeSimone, Robert Santora, B 819,517, Cl. 252-187.00H.
Polaroid Corporation: *See—*
Choinski, Edward J., B 801,144, Cl. 427-420.000.
Driscoll, John J.; and Wareham, Richard R., B 749,511, Cl. 354-76.000.
Evans, David H.; and Greenwald, Richard B., B 784,669, Cl. 260-327.00M.
Pole, Robert Vladimir; and Werlich, Harald Willy, to International Business Machines Corporation. Holographic opaque document scanner. B 798,042, Cl. 350-3.710.
Polotsky, Vadim Evgenievich: *See—*
Vasiliev, Vladimir Sergeevich; Annenberg, Ernest Alexandrovich; Livshits, Abram Lazarevich; Polotsky, Vadim Evgenievich; and Lakhtjukhov, Valery Mikhailovich, B 780,357, Cl. 219-69.00W.
Ponczak, Samuel; and Olmstead, John Aaron, to RCA Corporation. Method of forming a curved implanted region in a semiconductor body. B 763,721, Cl. 148-1.500.
Ponomarenko, Jury Filippovich: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.
Portalier, Robert: *See—*
Gauvry, Robert; and Portalier, Robert, B 778,233, Cl. 75-148.000.
Portnoy, Robert Charles, to Du Pont de Nemours, E. I., and Company. Arylthiodicyanopyrazines as plant disease control agents. B 805,150, Cl. 544-408.000.
Posi-Seal International, Inc.: *See—*
Simmons, Kenneth C.; Champlin, Harry C., Jr.; Livorsi, Carl F.; and Wucik, Joseph A., Jr., B 797,921, Cl. 277-168.000.
Poskitt, Walter Edward, to IMASCO Limited. Electronic moisture meter. B 715,170, Cl. 324-61.0QS.
Possati, Mario, to Finike Italiana Marposs Soc. in Accomandita Semplice di Mario Possati & C. Measuring and control apparatus for internal grinding machines. 4,112,629, Cl. 51-165.930.
Pound, Thomas Charles; and Gouldson, Eric John, to Northern Telecom Limited. Paper pulp insulated cable and method of manufacture. B 672,366, Cl. 156-56.000.
Pounds, William J. Method and apparatus for railroad car shunting. B 777,032, Cl. 213-75.00R.
Pourrias, Bernard M.: *See—*
Bourgery, Guy R.; Lacour, Alain P.; Pourrias, Bernard M.; and Bregeon, Genevieve C., B 813,357, Cl. 544-360.000.
PPG Industries, Inc.: *See—*
Gillery, F. Howard, B 836,269, Cl. 204-192.00P.
Hahn, Ernest A., B 778,210, Cl. 427-44.000.
Hardies, Donald E.; and Rinehart, Jay K., B 784,874, Cl. 424-301.000.
Jozwiak, Edward L., Jr.; and Das, Suryya K., B 804,410, Cl. 204-181.00R.
McHenry, Donald L.; and Bechtel, Charles H., B 746,270, Cl. 106-287.180.
Niederst, Kenneth W., B 801,673, Cl. 260-22.00T.
Praschl, Wilhelm: *See—*
Theurer, Josef; Praschl, Wilhelm; and Riessberger, Klaus, B 672,276, Cl. 212-28.000.
Pratte, John R.: *See—*
Ehrhart, Leonard M.; Pratte, John R.; and Mazik, Paul E., Jr., 4,112,621, Cl. 49-400.000.
Preh-Elektrofeinmechanische Werke-Jakob Preh Nachf: *See—*
Hochgesang, Gerhard, B 707,337, Cl. 200-67.00C.
Prelube Corporation: *See—*
Percy, Donald W., 4,112,910, Cl. 123-196.00S.
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft; and Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Process for the preparation of propylene oxide. B 678,822, Cl. 260-348.250.
Pressley, Robert J.; and Fahlen, Theodore S., to GTE Sylvania Incorporated. Apparatus and method for initiating electrical discharge in a laser. B 773,826, Cl. 331-94.5PE.
Preston, Edward George; and Doerman, Eryk Stefan, to Molins Limited. Testing of cigarettes. 4,112,954, Cl. 131-21.00R.
Price, Brian George, to Imperial Chemical Industries Limited. Acrylic sheet having improved thermoshaping properties. B 580,147, Cl. 260-885.000.
Pries, Erich, to Dr. C. Otto & Comp. G.m.b.H. Rich-gas burner arrangement in heating flues for coke oven chambers. B 747,381, Cl. 202-139.000.
Priola, Aldo: *See—*
Cesca, Sebastiano; Priola, Aldo; and Ferraris, Giuseppe, B 795,225, Cl. 260-683.15B.
Procter & Gamble Company, The: *See—*
Dirksing, Robert S.; and Todd, Estel R., B 845,064, Cl. 366-167.000.
Fleisch, Herbert A.; and Felix, Rolf, B 792,946, Cl. 424-204.000.
Fleisch, Herbert A.; and Felix, Rolf, B 792,947, Cl. 424-204.000.
Hagner, Clifford K.; and Wissel, Richard B., B 781,385, Cl. 252-8.600.
Protective Treatments, Inc.: *See—*
Wenrick, Brian A., B 753,449, Cl. 293-71.00R.
Pryor, Michael J.: *See—*
Fister, Julius C., Jr.; Breedis, John F.; and Pryor, Michael J., B 784,155, Cl. 75-142.000.
Psencik, Erich, to Dynamit Nobel Aktiengesellschaft. Method of preparing polyester varnish resins of low viscosity. B 598,084, Cl. 528-75.000.
Pulliam, Daniel N.: *See—*
Lazenby, Webber W.; and Pulliam, Daniel N., B 820,930, Cl. 220-5.00A.
Pullman Incorporated: *See—*
Ehrhart, Leonard M.; Pratte, John R.; and Mazik, Paul E., Jr., 4,112,621, Cl. 49-400.000.
Rousseau, George L.; and Snyder, Richard C., 4,112,851, Cl. 105-199.00C.
Pupp, Herwig; and Andersson, Otto Birger, to AB Ziristor. Opening arrangement for packing containers. B 777,940, Cl. 206-606.000.
Purdue Frederick Company, The: *See—*
Shetty, Bola Vithal, B 797,094, Cl. 424-150.000.
Purohit, Kailash S.: *See—*
Henig, Yair Steve; and Purohit, Kailash S., B 771,486, Cl. 426-422.000.
Purviance, Billy Joe. Device for injecting a liquid into the trunk of a tree. 4,112,617, Cl. 47-57.500.
Puschmann, Sigfrid: *See—*
Keck, Johannes; Puschmann, Sigfrid; Kruger, Gerd; Noll, Klaus-Reinhold; Leitold, Matyas; and Pieper, Helmut, B 812,325, Cl. 260-570.900.
Putman, Edgar N.; Patterson, George; Wimer, Scotty; and McCool, John B., 3rd, to PFD/Penn Color, Inc. Producing dispersant compositions compatible with many resin systems. B 601,628, Cl. 252-363.500.
Putsch, Peter Ulrich, to Keiper Trainingsysteme GmbH & Co. Ergometer. 4,112,928, Cl. 128-2.05R.
Quellette Machinery Systems, Inc.: *See—*
Ouellette, Joseph Fernand; and Poeling, David L., 4,112,776, Cl. 73-665.000.
Quibell, Peter R., to Raymond Lee Organization, Inc., The, a part interest. Conga drum set. 4,112,807, Cl. 84-411.00R.
Quinlan, Patrick M., to Petrolite Corporation. Polyquaternary polythiazines. B 713,666, Cl. 424-78.000.
Quinn, Edwin J.: *See—*
Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., B 878,679, Cl. 521-95.000.
Quinn, Jack Edward. Device for inserting and removing contact lens. B 858,436, Cl. 294-1.0CA.
Raab, Frederick Herbert, to Cincinnati Electronics Corporation. Position determining apparatus and method. B 710,298, Cl. 343-105.00R.
Raasch, Hans; and Muller, Lothar, to W. Schlafhorst & Co. Method and

apparatus for winding conical coils or cheeses at constant thread-feeding velocity. B 633,707, Cl. 242-18.00R.
Rabet, Farroch: *See—*
Lehmkuhl, Herbert; and Rabet, Farroch, B 711,742, Cl. 252-363.500.
Rabi, Rafat T.; Murphy, Edward J.; and Basoms, John A., to DeSoto, Inc. Cathodic electrodeposition of polyamine resins using carbonic acid neutralization. B 745,240, Cl. 204-181.00C.
Rados, Stephen E.: *See—*
Bowker, Donald R.; Klein, Donald J.; and Rados, Stephen E., B 656,538, Cl. 264-295.000.
Radunz, Hans-Eckart: *See—*
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, B 739,142, Cl. 424-205.000.
Ragains, Wilbur G., to Phillips Petroleum Company. Fluid actuated valve. 4,112,766, Cl. 73-422.0GC.
RAI Research Corporation: *See—*
D'Agostino, Vincent F.; Lee, Joseph Y.; and Cook, Edward H., Jr., B 850,194, Cl. 429-33.000.
Rambacher, Paul; and Make, Siegfried, to Diamalt Aktiengesellschaft. Process for preparing orotic acid and thioorotic acid. B 831,053, Cl. 544-314.000.
Ramsower, Vernon. Quick latch for farm tool bar. B 769,433, Cl. 172-272.000.
Randall, John J., Jr.; and Bernard, Walter J., to Sprague Electric Company. Process for producing an aluminum electrolytic capacitor having a stable oxide film. B 791,656, Cl. 204-33.000.
Randall, Virginia G.: *See—*
Masri, Merle S.; Randall, Virginia G.; and Stanley, William L., B 827,659, Cl. 195-63.000.
Rank Xerox, Ltd.: *See—*
Harada, Masaaki; and Fujita, Tsuguto, B 816,773, Cl. 355-71.000.
Nishide, Hiroo; and Uehara, Yasuhiro, B 801,678, Cl. 219-216.000.
Ranko, Frederick E.: *See—*
Ranko, Jerry; and Ranko, Frederick E., 4,112,656, Cl. 56-320.100.
Ranko, Jerry; and Ranko, Frederick E. Lawn mowing brush cutter. 4,112,656, Cl. 56-320.100.
Rao, Babu Y.; Nolan, John T., Jr.; and Estes, John H., to Texaco Inc. Hydroisomerization of normal paraffin with a catalyst of noble metal, alumina support and chlorine. B 774,099, Cl. 260-683.680.
Rapata, George M., to Illinois Tool Works Inc. Protective electrical device. B 810,532, Cl. 339-113.00R.
Rath, Gero: *See—*
Gudenau, H. W.; Konig, Horst; Rath, Gero; and Roth, Haye, B 771,748, Cl. 75-12.000.
Rath, Heinz-Jorg: *See—*
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, B 737,249, Cl. 148-174.000.
Rau, G.: *See—*
Stockel, Dieter; and Schneider, Friedrich, 4,112,905, Cl. 123-169.0EL.
Raupach, Gerhard: *See—*
Affeldt, Karl-Heinz; Fritzsche, Gunther; Ganzke, Joachim; and Raupach, Gerhard, 4,112,929, Cl. 128-2.05M.
Ray, Louis F. Constant balance crane. B 714,228, Cl. 212-71.000.
Ray, Ranjan: *See—*
Tanner, Lee E.; and Ray, Ranjan, B 823,080, Cl. 75-177.000.
Raychem Corporation: *See—*
Nyberg, David Dolph, B 856,500, Cl. 204-159.150.
Raygo, Inc.: *See—*
Carlson, Roger L., B 807,833, Cl. 173-49.000.
Raymond Lee Organization, Inc., The: *See—*
Muskus, Meryl L., 4,112,816, Cl. 87-12.000.
Parkes, Alvin E., 4,112,940, Cl. 128-188.000.
Quibell, Peter R., 4,112,807, Cl. 84-411.00R.
Raytheon Company: *See—*
Sandy, Frank; and Schulz, Manfred B., B 689,398, Cl. 333-72.000.
Razuvaev, Nikolai Ivanovich: *See—*
Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich, 4,112,702, Cl. 62-123.000.
RB Toy Development Co.: *See—*
Imes, Jack, Jr., B 753,171, Cl. 273-95.00R.
RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, B 751,588, Cl. 324-51.000.
Chinery, Jack Joseph, B 790,199, Cl. 324-158.00D.
Curtice, Walter Richard, B 792,418, Cl. 307-260.000.
D'Amato, Ralph James, 4,112,562, Cl. 29-25.140.
DeStephanis, Ralph, B 801,728, Cl. 274-9.00B.
Herzog, Gerald Bernard, B 700,120, Cl. 250-211.00K.
Hollingsworth, Richard James, B 796,333, Cl. 307-362.000.
Hunka, George William, B 782,754, Cl. 250-202.000.
Katz, George, B 771,679, Cl. 148-23.000.
Nosker, Richard William, B 327,804, Cl. 427-140.000.
Pankove, Jacques Isaac; and Marlowe, Frank Jerome, B 775,864, Cl. 324-121.00R.
Pankove, Jacques Isaac; and Lampert, Murray Alfred, B 869,641, Cl. 148-1.500.
Ponczak, Samuel; and Olmstead, John Aaron, B 763,721, Cl. 148-1.500.
Willis, Donald Henry, B 819,187, Cl. 315-411.000.
Reagan, Larry L.: *See—*
Brown, William L.; and Reagan, Larry L., B 767,267, Cl. 214-16.40A.
Rechter, Harold L., to Chicago Fire Brick Company. Aluminous refractory composition. B 770,117, Cl. 106-67.000.
Reckitt & Colman Products Limited: *See—*
Scaife, Colin, 4,112,942, Cl. 128-225.000.
Rector, Charles B. Anti-pollution device for industrial stacks. B 811,129, Cl. 55-263.000.
Reeder, Thomas M., to United Technologies Corporation. Two-dimensional surface acoustic wave signal processor. B 820,474, Cl. 333-30.00R.
Regie Nationale des Usines Renault: *See—*
Poisson, Bernard, B 787,514, Cl. 164-227.000.
Rehder, Gunther: *See—*
Dadurian, Aram; and Rehder, Gunther, 4,112,522, Cl. 3-1.910.
Rehklau, George D., to Electro-Sound, Inc. Magnetic tape cartridge loading apparatus. B 738,899, Cl. 242-56.00R.
Reibetanz, Wilbert: *See—*
Wanner, Karl; and Reibetanz, Wilbert, B 749,034, Cl. 175-207.000.
Reid, Robert C.: *See—*
Modell, Michael; Reid, Robert C.; and Amin, Sanjay L, B 742,712, Cl. 48-202.000.
Reida, William D., to AMI Industries, Inc. Single pivot connection for a legrest. B 818,805, Cl. 297-433.000.
Reifsnyder, Howard B., to Construction Specialties, Inc. Foot grille. 4,112,640, Cl. 52-177.000.
Reineck, Lester W.: *See—*
Fields, Ernest E.; and Reineck, Lester W., B 823,614, Cl. 220-367.000.
Reinhardt, James R.; and Scott, Mark P., to ACF Industries, Incorporated. Valve closure for railway car cushioning device. B 833,947, Cl. 213-43.000.
Remkes, Elmer R.: *See—*
Chang, Nuke Ming; Remkes, Elmer R.; and Cook, William, Jr., 4,112,695, Cl. 405-163.000.
Renco Corporation: *See—*
Carlson, David L., 4,112,927, Cl. 128-2.00V.
Renger, Udo: *See—*
Heitland, Herbert; and Renger, Udo, 4,112,878, Cl. 123-32.0ST.
Renner, Johann: *See—*
Fiege, Helmut; Haydn, Josef; Renner, Johann; and Wedemeyer, Karlfried, B 757,422, Cl. 568-756.000.
Repa Feinstanzwerk GmbH: *See—*
Fohl, Artur, 4,112,996, Cl. 160-296.000.
Research Corporation: *See—*
Hulka, Jaroslav Fabian; and Clemens, George Selden, 4,112,951, Cl. 128-346.000.
Research Engineering & Manufacturing, Inc.: *See—*
Wardwell, Charles H.; and Holcomb, Norman L., 4,112,812, Cl. 85-46.000.
Research Frontiers Incorporated: *See—*
Saxe, Robert L.; Thompson, Robert I.; and Forlini, Matthew, B 795,819, Cl. 350-362.000.
Research Machine & Development, Inc.: *See—*
Wippich, Joachim, 4,112,716, Cl. 70-38.00C.
Resnick, Paul Raphael; and Grot, Walther Gustav, to Du Pont de Nemours, E. I., and Company. Method and apparatus for electrolysis of alkali or alkaline earth metal halide. B 835,804, Cl. 204-98.000.
Respiratory Care, Inc.: *See—*
Cambio, Orlando D., Jr., B 867,043, Cl. 215-1.00C.
Reuschling, Dieter-Bernd: *See—*
Linkies, Adolf; Reuschling, Dieter-Bernd; Kuhlein, Klaus; Beck, Gerhard; and Musil, Josef, B 751,173, Cl. 424-274.000.
Reutlinger, Suzana: *See—*
Krasovec, Branko; Mihelic, Eli; and Reutlinger, Suzana, B 778,319, Cl. 426-56.000.
Reynolds Metals Company: *See—*
Weston, David, B 736,466, Cl. 75-2.000.
Reynolds, Rollin K.: *See—*
United States of America, National Aeronautics and Space Administration; Laumann, Eugene A.; and Reynolds, Rollin K., 4,112,875, Cl. 123-1.00A.
Rhode Island Hospital: *See—*
Abts, Leigh Roy, 4,112,773, Cl. 73-642.000.
Rhone-Poulenc S.A.: *See—*
Balme, Maurice; and Gruffaz, Max, B 297,738, Cl. 260-326.260.
Bost, Pierre-Etienne; and Lartigau, Guy, B 473,267, Cl. 260-592.000.
Richard, Gerard Yves, to Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C. Process for regenerating foundry sand. B 730,829, Cl. 134-2.000.
Richard, Yves Robert: *See—*
Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, B 605,926, Cl. 204-180.00R.
Richardson, Eugene E.; and Sidorowicz, Frank, to Standard Oil Company (Indiana). Continuous process for sulfonating alkyl aromatics. B 741,842, Cl. 260-505.00S.
Richardson, Jack M.: *See—*
Graef, Harry T.; Richardson, Jack M.; and Wolfarth, Robert P., B 761,288, Cl. 221-6.000.
Richardson, Warner G.; and Wilson, Eugene M., to Caterpillar Tractor Co. Fender. B 826,576, Cl. 280-154.50R.

Richly, Walter: *See—*
Keimer, Hildegard; Schmid, Emil; and Richly, Walter, B 742,688, Cl. 427-108.000.
Richmond, Donald Louis, to Air Preheater Company, Inc., The. Bag tensioning arrangement. B 862,894, Cl. 55-378.000.
Richter, Sidney B.: *See—*
Stach, Leonard J.; Hotz, Roger D.; and Richter, Sidney B., B 784,212, Cl. 71-88.000.
Ricoh Company, Ltd.: *See—*
Furukawa, Akio, B 796,072, Cl. 354-149.000.
Itoh, Tadanao, B 731,679, Cl. 360-2.000.
Suzuki, Koichi; Suzuki, Shigeru; and Suzuki, Minoru, 4,112,867, Cl. 118-7.000.
Ricoh Educational Equipment Co., Ltd.: *See—*
Itoh, Tadanao, B 731,679, Cl. 360-2.000.
Riebel, Hans-Jochem: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Homeyer, Bernhard; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, B 645,128, Cl. 424-200.000.
Riede, Gerhard, to Gambro AG. Diffusion device. B 802,363, Cl. 210-321.00B.
Riedle, Rudolf: *See—*
Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, B 808,767, Cl. 260-448.20E.
Riel, Klaus: *See—*
Schwartz, Reinhard; Knapp, Heinrich; Riel, Klaus; and Peters, Klaus-Jurgen, 4,112,900, Cl. 123-139.0AW.
Riessberger, Klaus: *See—*
Theurer, Josef; Praschl, Wilhelm; and Riessberger, Klaus, B 672,276, Cl. 212-28.000.
Rikimaru, Hiroaki: *See—*
Abe, Kazunobu; Rikimaru, Hiroaki; Yamazaki, Iwao; and Hasegawa, Hiroshi, B 753,323, Cl. 252-455.00R.
Riley, Kenneth L.; and Pine, Lloyd A., to Exxon Research & Engineering Co. Hydrotreating catalyst and process utilizing the same. B 773,427, Cl. 252-439.000.
Rinehart, Jay K.: *See—*
Hardies, Donald E.; and Rinehart, Jay K., B 784,874, Cl. 424-301.000.
Rissberger, C. Glen. Accessory kit and method for providing supplemental anti-sway control for automotive vehicles. B 797,740, Cl. 280-689.000.
Rivers, Ronald D., to Cabot Corporation. Method of injection molding powder metal parts. B 748,821, Cl. 75-214.000.
Riviere, Henry W.: *See—*
Faulkenberry, Wayne J.; and Riviere, Henry W., B 798,655, Cl. 330-207.00P.
Rizk, Samy F. Combination alveolar ridge protector and anesthetic administration aid. 4,112,934, Cl. 128-12.000.
Robbins, Clarence R.: *See—*
Carson, John C., Jr.; Robbins, Clarence R.; and Kenkare, Divaker B., 4,112,536, Cl. 15-104.940.
Robbins & Myers, Inc.: *See—*
Thomas, Richard J., 4,112,786, Cl. 74-606.00R.
Robert Bosch GmbH: *See—*
Affeldt, Karl-Heinz; Fritzsche, Gunther; Ganzke, Joachim; and Raupach, Gerhard, 4,112,929, Cl. 128-2.05M.
Assenheimer, Jurgen; Bianchi, Valerio; Brettschneider, Johannes; Latsch, Reinhard; and Scherenberg, Dieter, 4,112,879, Cl. 123-32.0EA.
Manger, Hansjorg; Sohner, Gerhard; and Hohne, Gerd, 4,112,890, Cl. 123-117.00R.
Olbrich, Gottfried; and Weigert, Wilhelm, 4,112,978, Cl. 138-30.000.
Schwartz, Reinhard; Knapp, Heinrich; Riel, Klaus; and Peters, Klaus-Jurgen, 4,112,900, Cl. 123-139.0AW.
Wanner, Karl; and Reibetanz, Wilbert, B 749,034, Cl. 175-207.000.
Roberts Corporation: *See—*
Gasper, Stephen A., 4,112,999, Cl. 164-154.000.
Roberts, Jack C. Drying rack assembly for bathing compartments. 4,112,525, Cl. 4-154.000.
Robertshaw Controls Company: *See—*
Parsons, Bruce B.; and Wolfe, Denis G., B 758,036, Cl. 337-387.000.
Robinson, Don: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; and Robinson, Don, B 770,186, Cl. 273-108.000.
Robinson, Hugh A.: *See—*
Turner, Robert Bruce; Menzin, Marvin; Robinson, Hugh A.; and Williams, Thomas S., 4,112,762, Cl. 73-343.00R.
Robinson, John William; Crosby, Thomas C.; and Howell, Stephen Louis, to Kimball International, Inc. Organ circuitry for providing fill notes and method of operating the organ. 4,112,802, Cl. 84-1.010.
Roccisano, Janet: *See—*
Ferrara, Louis Thomas; and Roccisano, Janet, 4,112,924, Cl. 128-2.00F.
Roces, Rafael Tuti. Hydraulic coupling and speed multiplying mechanism. 4,112,681, Cl. 60-539.000.
Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft M.B.H. Furniture hinge. 4,112,543, Cl. 16-164.000.
Rocket Research Corp.: *See—*
Van Ornum, Joel V.; and Stang, Peter L., B 595,351, Cl. 260-876.00B.
Rockwell International Corporation: *See—*
Grant, Louis R.; and Flanagan, Joseph E., B 732,624, Cl. 260-564.00G.
Hamilton, C. Howard; and Ascani, Leonard A., B 736,671, Cl. 148-11.50R.
Loyd, Morris S., B 791,360, Cl. 428-162.000.
Shutt, Sidney G., B 768,511, Cl. 356-106.0LR.
Thackston, Clyde David; and Alexander, Robert H., B 811,423, Cl. 192-150.000.
Rodach, Alexander, to Irma Ungerer Geb. Dollinger. Reel for coiling strip. B 779,465, Cl. 242-78.300.
Rodda, John C., to Xerox Corporation. Cleaning apparatus for reproducing machine. B 800,581, Cl. 355-15.000.
Rodgers, Lewis. Rotating kite. B 840,979, Cl. 244-153.00A.
Rogers Corporation: *See—*
McGarry, Francis J.; Greene, Donald; and Otto, Jeffrey B., B 847,571, Cl. 162-123.000.
Rogers, Ronald D., to Alco Standard Corporation. Method for circulating a heat treating gas. B 781,113, Cl 432-25.000.
Rogler, Walter: *See—*
Kreuzburg, Gerhard; Lenz, Arnold; and Rogler, Walter, B 706,864, Cl. 260-448.80A.
Rohm GmbH: *See—*
Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, B 827,771, Cl. 260-463.000.
Rohm and Haas Company: *See—*
Rosenthal, Isadore; Exner, Lawrence J.; Niksa, Gregory J.; Weiss, Warren I.; and Young, Maurice G., 4,112,714, Cl. 68-206.000.
Smiley, Leonard H., B 686,193, Cl. 428-310.000.
Rohr, Harry: *See—*
Bischoff, Jurgen; Kowitz, Friedrich; Ott, Karl-Heinz; Schuster, Herbert; Rohr, Harry; and Weitzel, Hans, B 400,980, Cl. 260-876.00R.
Rohr, Karl, to Kraftwerk Union Aktiengesellschaft. Auxiliary bearing for determining radial and axial play of turbine shafts. B 742,195, Cl. 308-9.000.
Roller Bearing Company of America: *See—*
Koch, Hans W., B 755,445, Cl. 308-187.100.
Rollo, Anita Hand; and Stearns, David Burrell, to International Business Machines Corporation. Automated hemodialysis treatment systems. B 749,585, Cl. 210-22.00A.
Rolls-Royce Limited: *See—*
Aldridge, Trevor John; Lock, Alan Howard; and Bell, Robert Martin Alistair, 4,112,747, Cl. 73-116.000.
Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Koutroulos, Jean, to Neste Oy. Photosensitive material containing di-iodopropyl cellulose, process for its manufacture and the use of this material. B 768,494, Cl. 96-1.0PC.
Romey, Ingo: *See—*
Kroger, Carl; Romey, Ingo; and Kolling, Georg, B 649,920, Cl. 264-120.000.
Rones, Josef; Moller, Siegfried; and Hoch, Helmut, to Oxy Metal Industries Corporation. Corrosion inhibitor for metal surfaces. B 781,820, Cl. 106-14.130.
Rose, John Brewster; and Staniland, Philip Anthony, to Imperial Chemical Industries Limited. Production of aromatic polymers. B 810,355, Cl. 528-126.000.
Rosenthal, Arthur Lee; Alpern, Marvin; and Meisch, Charles Edward, to Howmedica Inc. Apparatus for collecting body fluid. 4,112,949, Cl. 128-278.000.
Rosenthal, Isadore; Exner, Lawrence J.; Niksa, Gregory J.; Weiss, Warren I.; and Young, Maurice G., to Rohm and Haas Company. Asymmetric skein dyeing. 4,112,714, Cl. 68-206.000.
Ross, Ian Norman: *See—*
Gates, John William Charles; Hall, Roy Geoffrey Noel; Ross, Ian Norman; and Stevens, Richard Frederick, B 700,037, Cl. 356-110.000.
Ross, John P.; and Bernardi, Carl E., to National Semiconductor Corporation. Method for plating semiconductor chip headers. B 776,162, Cl. 204-15.000.
Rossmanith, Otto, to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung. Hose pump with friction drive of hollow, resilient roller means. B 764,022, Cl. 417-477.000.
Roth, Haye: *See—*
Gudenau, H. W.; Konig, Horst; Rath, Gero; and Roth, Haye, B 771,748, Cl. 75-12.000.
Rousseau, George L.; and Snyder, Richard C., to Pullman Incorporated. Resilient constant contact center bearing assembly. 4,112,851, Cl. 105-199.00C.
Rowland, Bob G.: *See—*
Johnson, Peter E.; and Rowland, Bob G., B 604,350, Cl. 429-143.000.
Royce Chemical Company: *See—*
Fono, Andrew; and Patton, Ray F., B 680,198, Cl. 8-34.000.
Royon, Jean Paul: *See—*
Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, B 605,926, Cl. 204-180.00R.
Ruby, William S.: *See—*
Hochstrasser, Otto; and Ruby, William S., B 826,189, Cl. 13-2.00R.
Ruckel, Erwin Richard; and Wang, Long Shyong, to Arizona Chemical Company. Polymerization of α-pinene. B 814,527, Cl. 252-429.00B.
Rudd, Wallace C.: *See—*
DuBosque, Clayton, Jr.; Rudd, Wallace C.; and Allen, Richard J., 4,112,566, Cl. 29-157.30C.
Ruenzi, Kurt. Apparatus for automatically feeding individual sheets from a stack through an office machine. B 779,755, Cl. 271-4.000.
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse,

Karl-Heinz, to WABCO Westinghouse GmbH. Digital control circuit for producing acceleration and deceleration control signals in an antiskid control system. B 809,886, Cl. 303-105.000.

Rumpp, Gerhard: *See—*
Kuhlmann, Wolf; and Rumpp, Gerhard, 4,112,813, Cl. 85-74.000.

Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., to Gas Developments Corporation. Air conditioning process. B 738,481, Cl. 165-3.000.

Russell, John J.: *See—*
Brana, George; and Russell, John J., B 840,305, Cl. 252-62.10P.

Russell, William Norman; Bruton, James Isaac; and Twilley, Ian Charles, to Allied Chemical Corporation. Process for preparing high strength polyamide and polyester filamentary yarn. B 829,764, Cl. 264-210.00F.

Rutgerswerke Aktiengesellschaft: *See—*
Gardziella, Arno; and Jellinek, Karl, B 650,649, Cl. 427-195.000.
Spengler, Hans; Bucksch, Gunter; and Morgenstern, Manfred, B 704,600, Cl. 526-64.000.

Ruti Machinery Works Ltd.: *See—*
Freisler, Erhard, 4,112,981, Cl. 139-102.000.

Ruti Machinery Works Ltd: *See—*
Oderbolz, Fredy; and Bebie, Paul, 4,112,983, Cl. 139-446.000.

Rutman, Grigory Iosifovich: *See—*
Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Sobolev, Valerian Mikhailovich; Rutman, Grigory Iosifovich; Logutov, Igor Jurievich; and Dolidze, Vladimir Romanovich, B 788,590, Cl. 568-789.000.

Rybny, Charles B.; Trebellas, John C.; and Sargent, Donald E., to Celanese Corporation. Trihalogenated hydrocarbons as co-photoinitiators. B 568,216, Cl. 204-159.160.

Ryder, Lyle C.: *See—*
Hill, Robert W.; Onnen, William G.; and Ryder, Lyle C., B 719,696, Cl. 264-262.000.

Rylander, DeMaris C. Child's playhouse type collapsible structure. 4,112,635, Cl. 52-69.000.

Ryzhov, Vladimir Dmitrievich; Litvinenko, Semen Kirillovich; Leikin, Roman Samuilovich; Kulberg, Anton Yanovich; Ioffe, Benyamin Alexandrovich; and Kalnin, Robert Karlovich. Device for contactless separation of individual ferromagnetic components from a flow of components. B 704,693, Cl. 221-171.000.

S. A. Beghin-Say: *See—*
Lesas, Claude H.; and Pierre, Michel, B 731,895, Cl. 536-56.000.

S. A. Labaz: *See—*
Pigerol, Charles; de Cointet de Fillain, Paul; and Nanthavong, Souli, B 667,557, Cl. 260-326.160.

Saab-Scania AB: *See—*
Bos, Frans, B 760,746, Cl. 296-137.00J.

Sabol, Albert R.; and Petrellis, Nicolas C., to Standard Oil Company (Indiana). Metal aryl dithiophosphates and their manufacture. B 773,346, Cl. 252-32.70E.

Sachetto, Jean-Pierre: *See—*
Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Koutroulos, Jean, B 768,494, Cl. 96-1.0PC.

Sackmann, Gunter; Hendricks, Udo-Winfried; Honig, Hans-Ludwig; Kolb, Gunter; and Muller, Friedhelm, to Bayer Aktiengesellschaft. Emulsions of resinic acid isocyanates as sizing agents for paper. B 749,455, Cl. 106-238.000.

Saegusa, Shigeharu: *See—*
Kiuchi, Mitsuyuki; Amagami, Keizo; Maeda, Shigeru; and Saegusa, Shigeharu, B 764,983, Cl. 219-10.49R.

Sahara, Takeshi: *See—*
Obinata, Shiro; Hashimoto, Shigeru; and Sahara, Takeshi, B 613,928, Cl. 209-167.000.

Said, Sami I.; and Mutt, Viktor. Vasoactive lung polypeptides. B 649,968, Cl. 260-112.00R.

Saijo, Shigeyoshi: *See—*
Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, B 793,920, Cl. 424-274.000.

Saiki, Atsushi; Okubo, Toshio; and Harada, Seiki, to Hitachi, Ltd. Method for fabricating semiconductor device and etchant for polymer resin. B 695,040, Cl. 156-656.000.

Sailas, Vaino, to Valmet Oy. Method of making strip-covered roll. 4,112,565, Cl. 29-148.40D.

Sain, Paul E., to Games Research Associates. Simulated golf game and materials therefor. B 769,557, Cl. 273-245.000.

Saint-Gobain Industries: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, B 829,515, Cl. 65-5.000.
Mattmuller, Rene, B 767,441, Cl. 65-135.000.

St. Luke's Hospital: *See—*
Hashim, George A., B 648,379, Cl. 424-177.000.

Saito, Isamu. Extracting black tea and coffee and closed extractor therefor. 4,112,830, Cl. 99-300.000.

Saito, Toranosuke: *See—*
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, B 812,737, Cl. 260-874.000.

Saito, Toshinori: *See—*
Kai, Fumio; Saito, Toshinori; Seki, Shigeo; and Kawasaki, Toyoaki, B 588,555, Cl. 544-27.000.

Sakai Chemical Industry Co., Ltd.: *See—*
Abe, Kazunobu; Rikimaru, Hiroaki; Yamazaki, Iwao; and Hasegawa, Hiroshi, B 753,323, Cl. 252-455.00R.

Sakai, Masaaki: *See—*
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, B 798,313, Cl. 274-15.00R.

Sakamoto, Yohei: *See—*
Kato, Hisao; and Sakamoto, Yohei, 4,112,602, Cl. 37-55.000.

Sakanaka, Takao, to Hitachi, Ltd. Coupling device of oil feeding pipe for rolling mill. 4,112,729, Cl. 72-236.000.

Sakurai, Toshio; Shimada, Shoji; and Kamimura, Yoshiharu, to Nippon Steel Corporation. Rust-proof lubricant compositions. B 710,312, Cl. 252-49.600.

Sala, Angelo, to Massey-Ferguson Services N.V. Controls for hydraulic valves. 4,112,976, Cl. 137-636.200.

Saladin, Emil: *See—*
Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, B 806,044, Cl. 521-108.000.

Sales, Buenaventura Z. Draw strings puller and fastener. 4,112,551, Cl. 24-117.000.

Salles, Yvon; Leger, Pierre; and David, Gerard Andre, to U.S. Philips Corporation. Apparatus for etching the edges of semiconductor plates. B 729,345, Cl. 156-345.000.

Salomon, Georges Pierre Joseph, to S.A. des Etablissements Francois Salomon & Fils. Devices for fastening ski boots. 4,112,557, Cl. 24-69.0SK.

Samuelson, Hans Olof, to Mo Och Domsjo Aktiebolag. Sodium sulfide pulping with hydrogen sulfide generation. B 763,203, Cl. 162-34.000.

Samuelsson, Kurt Anders, to Telefonaktiebolaget L M Ericsson. Method for improvement of crosstalk attenuation between adjacent channels in a time division multiplex system. B 757,863, Cl. 179-15.0AN.

Sanderson, Richard Barton, to Bell Telephone Laboratories, Incorporated. Voltage controlled current sources for active hybrid circuit. B 798,787, Cl. 179-170.0NC.

Sandhu, Mohammad Akram; and Tingler, Kenneth Lloyd, to Eastman Kodak Company. Amorphous polyester adhesives for photographic materials. B 778,635, Cl. 96-67.000.

Sando Iron Works Co., Ltd.: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,112,713, Cl. 68-5.00E.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Selvage curling prevention apparatus for a knitted cloth. 4,112,713, Cl. 68-5.00E.

Sandor, Leslie W., to Electric Machinery Mfg. Company. Welding of laminations of core-plated silicon steel. B 753,430, Cl. 219-137.00R.

Sandow, Kiyoshi, to Plasteco, Inc. Smoke and heat vent. 4,112,620, Cl. 49-8.000.

Sandoz, Inc.: *See—*
Denzer, Max; and Smith, Joseph A., B 790,896, Cl. 544-362.000.

Sands, Terry Michael. Board game apparatus with water ejecting device. B 745,614, Cl. 273-241.000.

Sandy, Frank; and Schulz, Manfred B., to Raytheon Company. Wide band low loss acoustic wave device. B 689,398, Cl. 333-72.000.

Sanford, Dale J., to Curfman, Brainerd, Harris, Bell, Weigans and Depew. Apparatus for disassembling pallets. 4,112,578, Cl. 29-700.000.

Sangamo Weston, Inc.: *See—*
Andreaggi, Joseph R., B 840,854, Cl. 339-176.0MP.

Sanko Kaihatsu Kagaku Kenkyusho: *See—*
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, B 812,737, Cl. 260-874.000.

Sano, Hiroshi, to Tomy Kogyo Co., Inc. Toy garage. 4,112,610, Cl. 46-12.000.

Sano, Takezo; Kobayashi, Akira; and Inoue, Haruo, to Sumitomo Chemical Company, Limited. Method for producing strong-acid cation exchange fiber by treating fibrous polyethylene with gaseous sulfur trioxide. B 699,255, Cl. 521-29.000.

Santa Fe International Corp.: *See—*
Chang, Nuke Ming; Remkes, Elmer R.; and Cook, William, Jr., 4,112,695, Cl. 405-163.000.

Sanyo-Kokusaku Pulp Co., Ltd.: *See—*
Shirakawa, Kiyoshi, B 803,932, Cl. 229-37.00R.

Saoyama, Yoshihito: *See—*
Nomaki, Koji; and Saoyama, Yoshihito, 4,112,868, Cl. 118-429.000.

Sarfati, Pierre, to Thomson-CSF. Arrangement enabling the contrast to be improved between the main echo video-frequency signal and a secondary echo video-frequency signal received by a pulse compression radar. B 818,221, Cl. 343-17.2PC.

Sargent, Donald E.: *See—*
Rybny, Charles B.; Trebellas, John C.; and Sargent, Donald E., B 568,216, Cl. 204-159.160.

Satake, Yasuo: *See—*
Nojiri, Shoji; Kanzaki, Hisao; Yasoshima, Nobuyuki; Satake, Yasuo; and Ogawa, Kenichi, B 788,971, Cl. 179-84.00R.

Sato, Hideaki: *See—*
Okunishi, Hiromu; Nakaji, Hideki; Suwa, Hiroyuki; and Sato, Hideaki, 4,112,732, Cl. 72-334.000.

Sato, Jiro, to Fujiwa Kika Kabushiki Kaisha. Pouring method and apparatus therefor. 4,112,998, Cl. 164-136.000.

Sato, Masamichi, to Fuji Photo Film Co., Ltd. Method for producing a photomask. B 694,423, Cl. 96-36.000.

Sato, Masamichi; and Fujii, Itsuo, to Fuji Photo Film Co., Ltd. Spin coating process. B 785,886, Cl. 96-67.000.

Sato, Seii: *See—*
Yamaguchi, Hisashi; Sato, Seii; Iemori, Toshiaki; and Andoh, Shizuo, B 767,690, Cl. 315-169.0TV.

Sato, Takami: *See*—
Kojimoto, Susumu; Sato, Takami; and Mori, Toshio, B 723,977, Cl. 264-89.000.
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, to Sony Corporation. Phonograph record player. B 798,313, Cl. 274-15.00R.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Portable label printing and applying machine. B 750,845, Cl. 156-384.000.
Satoh, Isao: *See*—
Kazama, Saburo; Abe, Hideo; Satoh, Isao; Ikeguchi, Takashi; Nogita, Shunsuke; Kubota, Masayoshi; and Muramori, Kiyoshi, B 720,502, Cl. 209-1.000.
Satoh, Shui: *See*—
Deguchi, Hidetaka; Kikuchi, Shoji; Wada, Hajime; Satoh, Shui; and Endo, Takaya, B 656,084, Cl. 96-66.00R.
Satou, Kouichirou: *See*—
Manabe, Kenshi; and Satou, Kouichirou, B 801,254, Cl. 307-279.000.
Saucy, Gabriel: *See*—
Cohen, Noal; and Saucy, Gabriel, B 797,712, Cl. 260-340.90R.
Saunders Valve Company Limited: *See*—
Jones, Alan Philip, B 761,900, Cl. 264-269.000.
Sauvage, Joseph. Drafting machine. 4,112,548, Cl. 19-243.000.
Savage, Bobbie O. Method and apparatus for selectively preventing or permitting sap flow to control bud formation. 4,112,616, Cl. 47-1.00R.
Savage, Bobbie O. Method and apparatus for selectively preventing or permitting systemic sap flow to control bud formation. 4,112,618, Cl. 47-58.000.
Savanick, George A.; and Krawza, Walter G., to United States of America, Interior. Well perforating method for solution well mining. B 809,881, Cl. 299-4.000.
Savitt, Jacob, to United States of America, Navy. Apparatus for detonating across a gap. 4,112,845, Cl. 102-27.00R.
Sawada, Takamasa: *See*—
Sone, Yoshiaki; Sawada, Takamasa; and Shirai, Masanari, B 806,515, Cl. 355-45.000.
Saxe, Robert L.; Thompson, Robert I.; and Forlini, Matthew, to Research Frontiers Incorporated. Light valve, light valve suspension materials and suspension therefor. B 795,819, Cl. 350-362.000.
Scaife, Colin, to Reckitt & Colman Products Limited. Method of preparing and administering a foam enema. 4,112,942, Cl. 128-225.000.
Schaaf, Thomas K.: *See*—
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., B 854,392, Cl. 260-347.300.
Schacham, Samuel E.: *See*—
Epstein, Max; Marhic, Michel E.; and Schacham, Samuel E., B 753,292, Cl. 331-94.50C.
Schafer, Werner; Buchwald, Holger; and Bischoff, Dieter, to Carl Freudenberg, Firma. Heat resistant nonwoven fabric and method of manufacturing same. B 637,488, Cl. 428-220.000.
Schafers, Heinrich Bernhard. Dowels and process for anchoring dowels. 4,112,814, Cl. 85-75.000.
Schafft, Hugo Willy, to Motorola, Inc. Electro-optic matrix display. B 756,216, Cl. 350-150.000.
Scharff, Dieter: *See*—
Haage, Karl; and Scharff, Dieter, B 609,944, Cl. 428-111.000.
Scheid, Lloyd J. Movable partition wall system. 4,112,647, Cl. 52-481.000.
Scheidler, Ralph E. Dual voltage battery system and electronic switch therefor. B 812,441, Cl. 320-7.000.
Schenk, Bernd, to ITW-Ateco G.m.b.H. Filler connection for vehicles driven by internal combustion engines. B 741,187, Cl. 296-1.00C.
Schenk, Hanspeter, to Givaudan Corporation. 2-Ethyl-6,6-dimethyl-2-cyclohexene-1-carboxylic acid ethyl ester perfume compositions. B 729,521, Cl. 252-522.000.
Scher, Bernard B. Fishing pole holding apparatus. 4,112,607, Cl. 43-17.000.
Scherenberg, Dieter: *See*—
Assenheimer, Jurgen; Bianchi, Valerio; Brettschneider, Johannes; Latsch, Reinhard; and Scherenberg, Dieter, 4,112,879, Cl. 123-32.0EA.
Schering AG: *See*—
Kruger, Hans, B 823,526, Cl. 260-306.80D.
Schering Aktiengesellschaft: *See*—
Arnold, Hanfried, B 751,676, Cl. 260-397.400.
Scheuermann, Horst: *See*—
Opgenorth, Hans-Joachim; and Scheuermann, Horst, B 810,950, Cl. 260-305.000.
Schibbye, Hjalmar; and Eriksson, Lennart, to Svenska Rotor Maskiner Aktiebolag. Method and means for cooling the oil in a system including a compressor with oil supply, as well as such systems. 4,112,701, Cl. 62-84.000.
Schiller, Rolf. Refuse collecting system and a vehicle and container for use therein. B 752,845, Cl. 214-302.000.
Schillinger, John D. Precision grader. B 822,747, Cl. 404-91.000.
Schippers, Heinz; Hensen, Friedhelm; Koslowski, Gerhard; and Czerwon, Dieter, to Barmag Barmer Maschinenfabrik AG. Process for producing low shrinkage film bands. B 722,558, Cl. 526-351.000.
Schlatter, James M.; and Goodmonson, Owen, to G. D. Searle & Co. Method for cleaving the peptide-resin bond in solid phase peptide synthesis by hydrogenolysis. B 807,083, Cl. 260-112.50R.
Schlecht, Helmut: *See*—
Distler, Harry; Schlecht, Helmut; and Hartert, Erwin, B 743,517, Cl. 260-465.50A.
Schlesinger, Sheldon I., to American Can Company. Compositions with organohalogen compound and diazonium salts as photoinitiators of epoxy compounds in photo-polymerization. B 658,207, Cl. 96-115.00P.
Schliephake, Dietrich: *See*—
Kurandt, Hans-Friedrich; and Schliephake, Dietrich, B 740,469, Cl. 423-170.000.
Schlosberg, Seymour; and Lerman, Michael J., to De Dietrich (USA), Inc. Method for repairing protectively lined reactor vessels. 4,112,572, Cl. 29-401.00R.
Schmid, Emil: *See*—
Keiner, Hildegard; Schmid, Emil; and Richly, Walter, B 742,688, Cl. 427-108.000.
Schmidt, Erich, to Maschinenfabrik Zuckermann Komm. Ges. Duplicating grinding machine. 4,112,628, Cl. 51-140.000.
Schmidt, Felix Helmut: *See*—
Stach, Kurt, deceased; Bosies, Elmar; Heerdt, Ruth; Kuhnle, Hans-Frieder; and Schmidt, Felix Helmut, B 674,993, Cl. 424-272.000.
Schmidt, Robert W. Adhesive dispensing device. B 777,022, Cl. 222-485.000.
Schnall, Gunther: *See*—
Eppe, Rudolf; Schnall, Gunther; Mullritter, Ludwig; Beck, Johann; and Hartwig, Karl, B 699,341, Cl. 355-8.000.
Schneider, Carl Michael, to Siemens Aktiengesellschaft. Electronic telephone system featuring switching networks having thyristors for single-wire switching. B 773,318, Cl. 179-18.0GF.
Schneider, Friedrich: *See*—
Stockel, Dieter; and Schneider, Friedrich, 4,112,905, Cl. 123-169.0EL.
Schneider, Heinz-Walter: *See*—
Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, B 780,297, Cl. 260-429.00R.
Schoen, William: *See*—
Ledoux, Will A.; Schoen, William; and Kumar, Atul, B 738,494, Cl. 166-275.000.
Schott, Charles W. Glass bead product. B 680,691, Cl. 428-402.000.
Schrauzer, Gerhard N.; and Guth, Ted D., to University of California, The Regents of the. Photoreduction of nitrogen. B 812,478, Cl. 204-157.10R.
Schreyer, Gerd: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, B 678,822, Cl. 260-348.250.
Schroeder, Guenter: *See*—
Gaenzler, Wolfgang; Kabs, Klaus; and Schroeder, Guenter, B 827,771, Cl. 260-463.000.
Schroth, Gerhard Wolfgang: *See*—
Fuhrman, Gunther Georg; Krogmann, Uwe Jonny; and Schroth, Gerhard Wolfgang, 4,112,856, Cl. 110-165.00R.
Schubert, Bernhard: *See*—
Bardenhagen, Dietrich; and Schubert, Bernhard, 4,112,651, Cl. 53-449.000.
Schulman, Jerome L.; and Kaplan, Jay, to Children's Memorial Hospital, The. Method and apparatus for measuring and treating hyperactivity in human beings. 4,112,926, Cl. 128-2.05S.
Schulz, Friedrich Wilhelm: *See*—
Kiefer, Udo; von Loeben, Wolf; and Schulz, Friedrich Wilhelm, B 783,407, Cl. 356-155.000.
Schulz, Manfred B.: *See*—
Sandy, Frank; and Schulz, Manfred B., B 689,398, Cl. 333-72.000.
Schulze, Heinz; and Waddill, Harold G., to Texaco Development Corporation. Polyether diamide epoxy additives. B 743,818, Cl. 528-94.000.
Schumacher, Ignatius; and White, James E., to Monsanto Company. Acrylic polymerization inhibition. B 734,893, Cl. 203-8.000.
SCHUMAG Schumacher Metallwerke Gesellschaft mit beschankter Haftung: *See*—
Wetzels, Walter, 4,112,625, Cl. 51-33.00W.
Schumag Schumacher Metallwerke Gesellschaft mit beschrankter Haftung: *See*—
Greven, Johann; and Mostert, Johann, 4,112,730, Cl. 72-290.000.
Schuman, Paul D.; Tarrant, Paul; Warner, Dale A.; and Westmoreland, Geraldine, to PCR, Inc. 5-Fluorouracil derivatives. B 665,865, Cl. 544-303.000.
Schumann, Werner Adolf: *See*—
Haarhoff, Pierre Cloete; and Schumann, Werner Adolf, B 819,016, Cl. 55-17.000.
Schundehutte, Karl Heinz: *See*—
Hugl, Herbert; Schundehutte, Karl Heinz; Trautner, Kersten; and Wolfrum, Gerhard, B 813,311, Cl. 8-41.00R.
Schuster, Herbert: *See*—
Bischoff, Jurgen; Kowitz, Friedrich; Ott, Karl-Heinz; Schuster, Herbert; Rohr, Harry; and Weitzel, Hans, B 400,980, Cl. 260-876.00R.
Schuster, Joachim: *See*—
Noack, Rolf; Schuster, Joachim; and Lohse, Udo, 4,112,728, Cl. 72-154.000.
Schwan, Thomas J., to Morton-Norwich Products. Inc. 2-[[6-Methoxy-(3,4-dihydro-2H-1-benzopyranyl)]amino]-1-phenylpropanol hydrochloride. B 783,811, Cl. 260-345.500.
Schwartz, Reinhard; Knapp, Heinrich; Riel, Klaus; and Peters, Klaus-Jurgen, to Robert Bosch GmbH. Fuel injection system. 4,112,900, Cl. 123-139.0AW.
Schweier, Gunther; Kolk, Erich; Mueller-Tamm, Heinz; Frielingsdorf, Hans; Bachl, Robert; and Gruber, Wolfgang, to BASF Aktiengesellschaft. Manufacture of homopolymers and copolymers of α-monoolefins. B 762,858, Cl. 526-124.000.
Schweiger, Fritz, to Hochtemperatur-Kernkraftwerk GmbH (HKG)

Gemeinsames Europaisches Unternehmen. Method of removing the decay heat of radioactive fission products. B 674,483, Cl. 176-38.000.
Schwerdtel, Wulf: *See—*
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, B 678,822, Cl. 260-348.250.
Schwirten, Kurt: *See—*
Kummer, Rudolf; Schneider, Heinz-Walter; and Schwirten, Kurt, B 780,297, Cl. 260-429.00R.
Schwob, Hans Peter: *See—*
Von Allmen, Martin; and Schwob, Hans Peter, B 728,403, Cl. 219-121.0LM.
Scientific Dimensions, Inc.: *See—*
O'Connell, Joseph J., B 785,326, Cl. 248-221.300.
Scintrex Limited: *See—*
Kaufman, Aleksander Arkadi, B 774,780, Cl. 324-1.000.
Scott, Donald M., to Fibre Containers Company. Packing box for china. B 737,600, Cl. 206-523.000.
Scott, Herman B. Coffee blenders. 4,112,831, Cl. 99-306.000.
Scott, Mark P.: *See—*
Reinhardt, James R.; and Scott, Mark P., B 833,947, Cl. 213-43.000.
Scott Paper Company: *See—*
Colby, Donald B., 4,112,855, Cl. 108-159.000.
Scott, Timothy C.: *See—*
Davis, Gerald L.; and Scott, Timothy C., 4,112,974, Cl. 137-625.290.
Sealectro Corporation: *See—*
Baio, Alfred R.; and Genovese, David L., B 800,732, Cl. 235-458.000.
Seatek Corporation: *See—*
Bergman, Gunnar B., 4,112,864, Cl. 114-265.000.
Seaver, William H. Apparatus for enabling the motion of a scriber to be reproduced. 4,112,597, Cl. 35-36.000.
Sebby, Carl M. Tow bar with towed vehicle suspension feature. B 812,896, Cl. 280-402.000.
Seco Tools Aktiebolag: *See—*
Loqvist, Kaj-Ragnar, 4,112,564, Cl. 29-148.40D.
Secretary of State for Social Services, The: *See—*
Duff, Ian David; Kennedy, John Hamilton; and Bunce, Roger Abraham, B 712,164, Cl. 422-63.000.
Seifert, Hermann: *See—*
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, B 678,822, Cl. 260-348.250.
Seiferth, Reinhard: *See—*
Wiedemann, Kurt; and Seiferth, Reinhard, B 056,013, Cl. 343-7.700.
Seikagaku Kogyo Co., Ltd.: *See—*
Fujita, Yoshimasa; Matsumoto, Akiyoshi; Miyachi, Isao; Imai, Nobuo; Kawakami, Isao; Hishida, Tadashi; and Kamata, Akira, B 780,843, Cl. 195-68.000.
Seiko Koki Kabushiki Kaisha: *See—*
Onda, Eiichi; Watanabe, Masanori; Nakagawa, Tadashi; Nemoto, Ichiro; and Koyama, Mitsuo, B 766,745, Cl. 354-249.000.
Seki, Shigeo: *See—*
Kai, Fumio; Saito, Toshinori; Seki, Shigeo; and Kawasaki, Toyoaki, B 588,555, Cl. 544-27.000.
Seki, Teruya: *See—*
Kamano, Yoshiaki; Michishita, Kazuhiko; Seki, Teruya; and Tanaka, Ichiro, B 671,693, Cl. 260-397.450.
Sekiguchi, Tadao, to Trio Kabushiki Kaisha. Digital frequency display device. B 767,832, Cl. 325-455.000.
Sekiguchi, Tetsuo: *See—*
Minagawa, Motonobu; Ohzeki, Toshio; and Sekiguchi, Tetsuo, B 806,521, Cl. 260-23.70M.
Sekihara, Takeshi; Emura, Tomoyuki; and Murashige, Masayuki, to Sumitomo Chemical Company, Limited. Process for polymerizing vinyl chloride monomer. B 874,748, Cl. 526-74.000.
Sekino, Jun: *See—*
Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, B 686,154, Cl. 424-317.000.
Sekisui Kaseikin Kogyo Kabushiki Kaisha: *See—*
Matsui, Takashi; Sugimura, Sadao; and Noo, Kunio, B 703,421, Cl. 264-230.000.
Sekmakas, Kazys, to DeSoto, Inc. Rapid curing high solids thermosetting coatings. B 726,141, Cl. 260-850.000.
Sekoulov, Ivan; and Muller, Wolf-Rudiger, to Sulzer Brothers Limited. Method of improving the operation of backwashable fixed beds formed of granular materials. B 771,958, Cl. 210-17.000.
Sekoulov, Ivan; and Muller, Wolf-Rudiger, to Sulzer Brothers Limited. Method of improving the backwashing of fixed beds formed of granular materials. B 771,959, Cl. 210-17.000.
Semenov, Vladimir Ivanovich: *See—*
Glushkov, Alexandr Ivanovich; Krutov, Sergei Vasilievich; Semenov, Vladimir Ivanovich; and Gusev, Anatoly Fedorovich, 4,112,547, Cl. 17-57.000.
Senkus, Raymond: *See—*
Andrews, Jeffrey F.; Mullin, Therese A.; and Senkus, Raymond, B 758,342, Cl. 424-81.000.
Seo, Mamoru; and Uenishi, Akio, to Mitsubishi Denki Kabushiki Kaisha. Coupling circuit using a photocoupler. B 764,177, Cl. 307-311.000.
Servo Corporation of America: *See—*
Glazar, Arthur J., B 841,700, Cl. 246-169.00A.
Seubert, Jurgen; Thomas, Herbert; and Andrews, Peter, to Merck Patent Gesellschaft mit Beschrankter Haftung. 2-Acyl-4-oxo-pyrazino-isoquinoline derivatives and process for the preparation thereof. B 742,132, Cl. 424-250.000.
Seuter, Friedel: *See—*
Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, B 693,971, Cl. 548-377.000.
Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, B 766,235, Cl. 424-273.00P.
Severdia, Anton; and Joseph, Adrian. Rotisserie and clockwork motor therefor. 4,112,832, Cl. 99-421.0HH.
Sfredda, Albert Patrick. Torque transmission device. 4,112,788, Cl. 74-804.000.
SGL Industries, Inc.: *See—*
Instone, John C., B 817,849, Cl. 339-22.00R.
Shackle, Dale Richard: *See—*
Spatz, Sydney Martin; and Shackle, Dale Richard, B 767,543, Cl. 282-27.500.
Shaffer, John W.: *See—*
Armstrong, Donald E.; Shaffer, John W.; Marecek, Paul M.; and Audesse, Emery G., B 724,792, Cl. 431-95.00A.
Shah, Champak C.: *See—*
Svedas, Stanley; and Shah, Champak C., B 649,078, Cl. 260-23.00R.
Shakespeare of Arkansas, Inc.: *See—*
Stewart, Alan; and Majefski, Richard Lee, B 744,337, Cl. 318-257.000.
Shanker, Irvin Paul; and Tryciecky, Teodozij, to Medcor, Inc. Pacer stimulator with improved lead connector. 4,112,953, Cl. 128-419.00P.
Sharp, John Howard: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, B 686,496, Cl. 423-512.00A.
Shaughnessy, William J.: *See—*
Koether, Bernard G.; and Shaughnessy, William J., B 790,429, Cl. 210-167.000.
Shaw, Harry, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Aerodynamic lifting mechanisms. B 804,237, Cl. 244-20.000.
Shaw, John B. Positive displacement gas expansion engine with low temperature differential. 4,112,688, Cl. 60-669.000.
Shaw, Julian David: *See—*
Cook, John Gerald; and Shaw, Julian David, B 611,037, Cl. 324-115.000.
Sheets, Kerney T. High rise sprinklers. B 758,648, Cl. 239-206.000.
Shein, Jury Gheorghievich: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.
Shell Internationale Research Maatschappij, B.V.: *See—*
Collins, Michael H., B 693,273, Cl. 427-236.000.
Shell Oil Company: *See—*
Hoff, Siebe; Ockers, Gerhardus; Buitelaar, Arnold A.; and Van De Kraats, Eduard J., B 779,645, Cl. 44-66.000.
Meijs, Franciscus H., B 852,175, Cl. 166-295.000.
Wulfers, Thomas F., B 852,395, Cl. 252-51.50A.
Shephard, Margaret Claire; Sugavanam, Balsubramanyan; Worthington, Paul Anthony; Collins, David John; and Griffin, David, to Imperial Chemical Industries Limited. Herbicidal formulations. B 750,017, Cl. 71-92.000.
Sherwin, William Claude, to Nortec Inc. Ski boot heel restraining apparatus. B 731,558, Cl. 280-615.000.
Sherwin-Williams Company, The: *See—*
Heyman, Duane A., B 818,172, Cl. 548-305.000.
Shetty, Bola Vithal, to Purdue Frederick Company, The. Process for the preparation of iodophor compounds and methods for stabilizing iodophor pharmaceutical compositions containing the same. B 797,094, Cl. 424-150.000.
Shibano, Yoshizo, to Sumitomo Electric Industries, Ltd. Magnetic current antenna. B 573,885, Cl. 343-741.000.
Shibata, Akio: *See—*
Hirota, Nobuyoshi; and Shibata, Akio, B 775,328, Cl. 260-8.000.
Shibata, Tadashi: *See—*
Shigeta, Masayuki; and Shibata, Tadashi, B 420,050, Cl. 187-1.00R.
Shibazaki, Kenji: *See—*
Murata, Tomoji; and Shibazaki, Kenji, B 740,725, Cl. 355-14.000.
Nakamura, Yoshihiro; Shibazaki, Kenji; Kono, Tateomi; Inagaki, Syotaro; and Murata, Tomoji, B 736,189, Cl. 355-14.000.
Shiga, Tetsuo; Ozaki, Masaru; Arakawa, Tatsumi; and Kobayashi, Hidehiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Dry image forming material. B 751,778, Cl. 96-114.100.
Shigeta, Masayuki; and Shibata, Tadashi, to Hitachi, Ltd. Elevator car mounting. B 420,050, Cl. 187-1.00R.
Shiina, Fumio, to Hitachi, Ltd. Optical card reader for setting frequency division ratio of programmable counter for use in synthesizer tuners. B 763,083, Cl. 250-569.000.
Shikibo Limited: *See—*
Terada, Yasuhiko; Yasuda, Jun; and Kuriyama, Masao, B 661,825, Cl. 8-120.000.
Shimada, Shoji: *See—*
Sakurai, Toshio; Shimada, Shoji; and Kamimura, Yoshiharu, B 710,312, Cl. 252-49.600.
Shimanaka, Hiroshi; Ichida, Toshio; and Kobayashi, Shigeru, to Kawa-

saki Steel Corporation. Method for forming a heat-resistant insulating film on a grain oriented silicon steel sheet. B 760,376, Cl. 148-113.000.

Shimek, Daniel C.: *See—*
Shimek, Ronald J.; and Shimek, Daniel C., 4,112,913, Cl. 126-120.000.

Shimek, Ronald J.; and Shimek, Daniel C. Free standing heating unit. 4,112,913, Cl. 126-120.000.

Shimizu, Hidemi: *See—*
Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, B 686,154, Cl. 424-317.000.

Shimizu, Junichi; Hara, Takashi; Iwakura, Tatsuya; and Itaya, Yoshiro, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Method of processing fermented soybeans and food products prepared therefrom. B 717,322, Cl. 426-602.000.

Shimizu, Makoto: *See—*
Nakada, Tetsuro; Shimizu, Makoto; and Yoshinaga, Mayumi, B 864,252, Cl. 266-137.000.

Shimizu, Masami: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Shimizu, Masami; Yoshikawa, Ryoichi; and Aizawa, Hiroshi, B 758,200, Cl. 354-238.000.

Shinomura, Toshihiko, to Nippon Oil Company Ltd. Synthetic paper. B 639,166, Cl. 428-113.000.

Shinshu Seiki Kabushiki Kaisha: *See—*
Minowa, Masahiro, B 736,046, Cl. 400-120.000.

Shirai, Masanari: *See—*
Sone, Yoshiaki; Sawada, Takamasa; and Shirai, Masanari, B 806,515, Cl. 355-45.000.

Shirakawa, Kiyoshi, to Sanyo-Kokusaku Pulp Co., Ltd. Bottom structure of cardboard type liquid packing container. B 803,932, Cl. 229-37.00R.

Shishido, Tadao; Hara, Hiroshi; and Arai, Atsuaki, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material capable of providing stable color images. B 806,121, Cl. 96-100.00R.

Shishido, Tadao: *See—*
Yamada, Minoru; Shishido, Tadao; and Arai, Atsuaki, B 686,201, Cl. 96-56.000.

Shmorgunenko, Nikolai Stepanovich: *See—*
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, B 702,208, Cl. 423-131.000.

Shoemaker, Arthur H., to American Optical Corporation. Microscope illuminator for both transmitted and vertical microscopy. B 607,842, Cl. 350-87.000.

Shoemaker, Robert H.; and Wood, William G. Liquid additions to fused chemical baths. B 759,763, Cl. 134-10.000.

Shogo, Iizuka; Mitsuo, Endo; Mitsugu, Watanabe; Toshio, Iizuka; and Kenji, Usui, to Yazaki Corporation. Process and apparatus for producing a wire-harness. B 737,025, Cl. 219-56.000.

Shooting Star Tennis: *See—*
Petrick, Paul J., Sr., 4,112,911, Cl. 124-56.000.

Shotwell, Allen M. Boat loader and unloader construction. B 826,266, Cl. 214-450.000.

Show, Roger; and Webb, Robert. Process for converting waste deadburned magnesium oxide-containing material into useful product. B 764,551, Cl. 423-155.000.

Showa Sangyo Kabushiki Kaisha: *See—*
Watanabe, Haruo; and Negishi, Masaaki, B 697,192, Cl. 260-424.000.

Shpirt, Mikhail Yakovlevich: *See—*
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, B 702,208, Cl. 423-131.000.

Shumway, Durland K.: *See—*
Kenkare, Divaker B.; and Shumway, Durland K., B 557,561, Cl. 424-46.000.

Shutt, Sidney G., to Rockwell International Corporation. Dual mode laser optics control for ring laser gyro. B 768,511, Cl. 356-106.0LR.

SI Handling Systems, Inc.: *See—*
Brown, William L.; and Reagan, Larry L., B 767,267, Cl. 214-16.40A.

Sidhu, Baldip Singh: *See—*
Syred, Nicholas; Grant, John; and Sidhu, Baldip Singh, 4,112,977, Cl. 137-812.000.

Sidley, Manfred: *See—*
Theunissen, Eos Lee, B 744,544, Cl. 242-55.300.

Sidorowicz, Frank: *See—*
Richardson, Eugene E.; and Sidorowicz, Frank, B 741,842, Cl. 260-505.00S.

Siegel, Hardo: *See—*
Aquila, Werner; Hoffmann, Werner; Himmele, Walter; and Siegel, Hardo, B 494,457, Cl. 260-599.000.

Siegle, Peter; Kuhle, Engelbert; Hammann, Ingeborg; Homeyer, Bernhard; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Sulfonic acid-N-methylamido-N-sulfenyl-N-methyl-carbamic acid esters. B 592,860, Cl. 424-278.000.

Siegrist, Adolf Emil; and Pauchard, Jean-Paul, to Ciba-Geigy Corporation. Stilbene compounds. B 850,861, Cl. 542-463.000.

Siegrist, Adolf Emil; and De Sousa, Bernardo, to Ciba-Geigy Corporation. Stilbene compounds. B 851,040, Cl. 542-464.000.

Siemens Aktiengesellschaft: *See—*
Bauch, Helmut; Mohrmann, Karl Heinz; and Koppehele, Frithjof, B 795,706, Cl. 330-56.000.
Baur, Guenter; and Greubel, Waldemar, B 782,186, Cl. 350-285.000.
Gaertner, Waldemar, B 782,187, Cl. 350-96.240.
Gerndt, Christian, B 635,366, Cl. 350-96.150.
Kiefer, Udo; von Loeben, Wolf; and Schulz, Friedrich Wilhelm, B 783,407, Cl. 356-155.000.
Krauss, Guenter, B 741,848, Cl. 333-71.000.
Mattuschka, Werner, B 830,046, Cl. 310-326.000.
Mentschel, Hellmuth, 4,112,876, Cl. 123-3.000.
Schneider, Carl Michael, B 773,318, Cl. 179-18.0GF.
Wiedemann, Kurt; and Seiferth, Reinhard, B 056,013, Cl. 343-7.700.

Sigel-Gfeller, Alwin. Conveyor apparatus for the interior of pipelines. 4,112,850, Cl. 104-138.00G.

Sigmund, Hermann. Process for the production of silicon layers. B 795,844, Cl. 156-622.000.

Sigurdsson, Per Arne, to Sigurdssons Mek. Verkstad. Method of pressure treatments of materials. B 778,565, Cl. 423-446.000.

Sigurdssons Mek. Verkstad: *See—*
Sigurdsson, Per Arne, B 778,565, Cl. 423-446.000.

Sikli, Bert J., to Staines, Robert. Scissors lift. B 781,545, Cl. 187-18.000.

Sillion, Bernard: *See—*
Cohen, Choua; and Sillion, Bernard, B 821,054, Cl. 252-51.50A.

Simmons, Kenneth C.; Champlin, Harry C., Jr.; Livorsi, Carl F.; and Wucik, Joseph A., Jr., to Posi-Seal International, Inc. Extended temperature range valve seal. B 797,921, Cl. 277-168.000.

Simmons, William D.: *See—*
Anderson, Lowell M.; and Simmons, William D., 4,112,692, Cl. 405-271.000.

Simon, Donald J.; and Fitzmayer, Louis H., to General Electric Company. Choke for combined microwave and self-cleaning oven. B 819,789, Cl. 219-10.55D.

Simon, Pierre, to Union Chimique Continentale-U.C.C. Process for the preparation of alpha-pyrones. B 695,751, Cl. 260-343.500.

Simon, Stefan: *See—*
Friese, Axel; and Simon, Stefan, B 731,954, Cl. 198-480.000.

Simpson, Dayton M.: *See—*
Lammert, Wayne F.; Simpson, Dayton M.; and Desai, Ardeshir R., 4,112,698, Cl. 405-167.000.

Simpson, Harold G., to Star Manufacturing Company of Oklahoma. Prefabricated watertight structural system. 4,112,632, Cl. 52-11.000.

Sims, Anson; and Jones, Lawrence T., to Aurora Products Corporation. Jaw breaker game. B 723,815, Cl. 273-249.000.

Sinclair, Clive Marles. Battery replacement device for continuous operation. B 757,197, Cl. 320-2.000.

Singer Company, The: *See—*
Feltz, Albert J.; and Deck, Howard C., B 811,913, Cl. 352-159.000.

Sinke, Gerard C.: *See—*
Langhorst, Martin A.; Sinke, Gerard C.; and Mossner, Elmer H., B 746,981, Cl. 75-101.00R.

Sintef: *See—*
Ugelstad, John, B 825,136, Cl. 260-29.6XA.

Sirtl, Erhard: *See—*
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, B 737,249, Cl. 148-174.000.

Sisk, Francis J.; and Veyo, Stephen E., to Electric Power Research Institute, Inc. Fuel fired supplementary heater for heat pump. 4,112,705, Cl. 62-238.000.

Sjostrand, Gunnar; and Sjostrand, Staffan, to Musikindustriell Forskning MIFO AB. Stringed instrument for play training. 4,112,809, Cl. 84-465.000.

Sjostrand, Staffan: *See—*
Sjostrand, Gunnar; and Sjostrand, Staffan, 4,112,809, Cl. 84-465.000.

Skalka, Gerald P., to Victor Stanley, Inc. Bench. B 873,976, Cl. 297-454.000.

Skinner, Dale D.: *See—*
Nelkin, Arthur; Skinner, Dale D.; Wilson, Donald G.; and Palmer, Harold D., B 791,434, Cl. 310-334.000.

Skinner, Leon S.; and Taylor, Norman C., to All Sunpower, Inc. Solar energy collector. 4,112,922, Cl. 126-271.000.

Skoli, Sigmund P.: *See—*
Mojonnier, Harry G.; and Skoli, Sigmund P., 4,112,828, Cl. 99-275.000.

Skotchinksy Institut Gornogo Dela: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.

Slater, Charles E.; Dunn, Paul E.; and Mustain, Lewis B., to Mosler Safe Company, The. On-line/off-line automated banking system. B 722,741, Cl. 235-419.000.

Slavik, John W. Fireplace enclosure with heat exchanger. 4,112,915, Cl. 126-121.000.

Sloan Valve Company: *See—*
Horowitz, Charles, B 799,506, Cl. 339-14.00P.

Horowitz, Charles, 4,112,961, Cl. 137-102.000.
Small, William H. Shelter construction and method of assembling same. 4,112,956, Cl. 135-1.00D.
Smeets, Lambertus R. J. M.: *See*—
Extra, Piet M. J.; Smeets, Lambertus R. J. M.; Van Bavel, Adrianus W. M.; Van Lieshout, Jacobus J.; and Deckers, Albert T., 4,112,870, Cl. 118-657.000.
Smets, Georges Joseph; and Vandensavel, Jean Marie, to Agfa-Gevaert, N.V. Masked isocyanates. B 406,350, Cl. 260-308.00D.
Smiley, Leonard H., to Rohm and Haas Company. Foamed cementitious material and composite. B 686,193, Cl. 428-310.000.
Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich. Freeze desalination and concentration apparatus. 4,112,702, Cl. 62-123.000.
Smith, Adrian P. Corrosion-resistant light-weight spot welding gun. B 641,994, Cl. 219-90.000.
Smith, George William, to USM Corporation. Tire grinding system. B 760,264, Cl. 241-24.000.
Smith, Herman W., to Upjohn Company, The. 3,7-Inter-m-phenylene-3-oxa-4,5,6-trinor-13,14-didehydro-11-deoxy-$PGF_1\alpha$ compounds. B 820,967, Cl. 560-61.000.
Smith, Herman W., to Upjohn Company, The. 3,7-Inter-m-phenylene-3-oxa-4,5,6-trinor-13,14-didehydro-11-deoxy-PGE_1 compounds. B 820,968, Cl. 560-53.000.
Smith, Herman W., to Upjohn Company, The. 5-Oxa-13,14-didehydro-11-deoxy-17-phenyl-18,19,20 trinor-PGE_1 compounds. B 820,976, Cl. 560-53.000.
Smith, Herman W., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-17-phenyl-18,19,20-trinor-$PGF_1\alpha$ compounds. B 820,977, Cl. 560-55.000.
Smith, Herman W., to Upjohn Company, The. 13,14-Didehydro-11-deoxy-17-phenyl-18,19,20-trinor-PGE_1 compounds. B 820,978, Cl. 560-53.000.
Smith, Herman W., to Upjohn Company, The. 3,7-Inter-m-phenylene-3-oxa-13,14-didehydro-11-deoxy-17-phenyl-4,5,6,18,19,20-hexanor-$PGF_1\alpha$ compounds. B 821,058, Cl. 560-61.000.
Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corp. Fluid solventless epoxy-anhydride compositions containing metal acetylacetonate accelerators and organic carboxylic acid co-accelerators. B 773,875, Cl. 260-830.0TW.
Smith, Joseph A.: *See*—
Denzer, Max; and Smith, Joseph A., B 790,896, Cl. 544-362.000.
Smith, Kenneth E.: *See*—
Hatcher, Charles S.; and Smith, Kenneth E., 4,112,667, Cl. 57-157.00S.
Smith, Richard D., to Kennecott Copper Corporation. Tarnish resistant copper alloy. B 769,723, Cl. 75-159.000.
Smith, Robert L.; Stokker, Gerald E.; and Cragoe, Edward J., Jr., to Merck & Co., Inc. Substituted 2-aminomethylphenyl sulfamates. B 833,930, Cl. 424-303.000.
Smith, Rodney I. Impact resistant tongue-and-groove coupling for highway traffic barricades. B 788,691, Cl. 404-6.000.
Smith, Roy B. Drive shaft "U" joint lubricator. B 807,984, Cl. 184-6.000.
Smith, Stanley E., to General Motors Corporation. Ball joint with slotted spring biased stud. B 829,279, Cl. 403-138.000.
Smith, Trevor, to British Gas Corporation. Fluid-flow noise reduction systems. B 714,984, Cl. 181-230.000.
Smyth, Norman Linfoot, to Britool Limited. Wrenches and other hand tools. 4,112,749, Cl. 73-139.000.
Snam Progetti, S.p.A.: *See*—
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, B 775,776, Cl. 260-875.000.
Cesca, Sebastiano; Priola, Aldo; and Ferraris, Giuseppe, B 795,225, Cl. 260-683.15B.
Snedeker, Clarke R.: *See*—
Flower, Robert J.; Snedeker, Clarke R.; and Beatenbough, Paul K., B 789,066, Cl. 165-81.000.
Sniegowski, Bruno Raymond: *See*—
Clement, George Frederick; and Sniegowski, Bruno Raymond, B 844,377, Cl. 179-2.00A.
Sniff, Walter Grant, Jr.: *See*—
Featherstone, Harry Edwin; and Sniff, Walter Grant, Jr., B 809,911, Cl. 219-137.00R.
Snyder, Francis H. Pinless resilient coupling. B 668,542, Cl. 403-154.000.
Snyder, John M., to Snyder, John M.; Steinberg, Bernard J.; and Halle, Edward. Auxiliary handle for plurality of carrying handles. 4,112,542, Cl. 16-114.00R.
Snyder, Richard C.: *See*—
Rousseau, George L.; and Snyder, Richard C., 4,112,851, Cl. 105-199.00C.
Snyder, Robert C.: *See*—
Bushman, Willard T.; and Snyder, Robert C., B 608,897, Cl. 235-474.000.
Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich. Inert gas generator based on air jet engine. B 679,437, Cl. 169-12.000.
Sobolev, Valerian Mikhailovich: *See*—
Michurov, Jury Ivanovich; Pantukh, Boris Izrailevich; Sobolev, Valerian Mikhailovich; Rutman, Grigory Iosifovich; Logutov, Igor Jurievich; and Dolidze, Vladimir Romanovich, B 788,590, Cl. 568-789.000.
S.A. des Etablissements Francois Salomon & Fils: *See*—
Salomon, Georges Pierre Joseph, 4,112,557, Cl. 24-69.0SK.
Societe Civile de Recherches et d'Etudes Nouvelles: *See*—
Orzales, Henri-Ange, B 705,535, Cl. 560-52.000.
Societe Coupax: *See*—
d'Arras, Philippe, 4,112,544, Cl. 17-25.000.
Societe d'Applications de Procedes Industriels et Chimiques S.A.P.I.C.: *See*—
Richard, Gerard Yves, B 730,829, Cl. 134-2.000.
Societe de Vente de l'Aluminium Pechiney: *See*—
Gauvry, Robert; and Portalier, Robert, B 778,233, Cl. 75-148.000.
Societe d'Etudes de Machines Thermiques: *See*—
Bouquet, Jean-Claude, 4,112,883, Cl. 123-52.00M.
Societe Industrielle et Financiere le Profil: *See*—
Boucard, Michel Jean, 4,112,722, Cl. 72-181.000.
Societe Miniere et Metallurgique de Penarroya: *See*—
Casalis, Jean-Arnaud; Teil, Yves; and Motte, Raymond, B 713,371, Cl. 210-219.000.
Societe Nationale des Poudres et Explosifs: *See*—
Lecolier, Serge L.; and Biehler, Jean-Marie J., B 838,460, Cl. 521-108.000.
Soeda, Takahiko: *See*—
Gomi, Teruo; Hisa, Yuji; and Soeda, Takahiko, B 790,440, Cl. 260-123.500.
Sohner, Gerhard: *See*—
Manger, Hansjorg; Sohner, Gerhard; and Hohne, Gerd, 4,112,890, Cl. 123-117.00R.
Soja, Lawrence M.; Stokes, Daniel F.; and Beile, Richard W., to Stone Container Corporation. Display carton. B 762,874, Cl. 206-602.000.
Solartron Electronic Group Ltd., The: *See*—
Cook, John Gerald; and Shaw, Julian David, B 611,037, Cl. 324-115.000.
Solco Basel AG: *See*—
Benes, Ivan, B 572,701, Cl. 424-1.000.
Solex Research Corporation of Japan: *See*—
Watanabe, Morio; and Nishimura, Sanji, B 773,657, Cl. 204-151.000.
Sone, Yoshiaki; Sawada, Takamasa; and Shirai, Masanari, to Canon Kabushiki Kaisha. Reader-printer. B 806,515, Cl. 355-45.000.
Sony Corporation: *See*—
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Osawa, Mitsuo, B 798,313, Cl. 274-15.00R.
Takizawa, Kazuyuki, B 740,306, Cl. 274-15.00R.
Tokumoto, Shin-Ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, B 801,640, Cl. 204-39.000.
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, B 802,487, Cl. 204-39.000.
Uzuka, Mitsuo, B 810,982, Cl. 318-138.000.
South African Inventions Development Corporation, The: *See*—
Hasson, Victor Haim; and von Bergmann, Hubertus Michael, B 692,085, Cl. 331-94.50G.
Southern Chemical Company: *See*—
Cotten, Roger C.; Young, David W.; and Kandanian, Aram Y., B 851,764, Cl. 260-897.00A.
Southern Imperial, Inc.: *See*—
Donnelli, Joseph W.; and Barnes, Richard D., B 821,809, Cl. 211-49.00R.
Southwest Research Institute: *See*—
Melton, Rosser B., Jr.; Colburn, John W., Jr.; and Wood, Charles D., III, B 515,310, Cl. 299-13.000.
Soxil S.p.A.: *See*—
Visconti, Matteo, 4,112,939, Cl. 128-186.000.
Spagnola, Raymond J., Jr. Bingo chip dispenser. B 773,782, Cl. 221-267.000.
Spatz, Sydney Martin; and Shackle, Dale Richard, to Mead Corporation, The. Pressure-sensitive carbonless copy system and transfer sheet for use therein. B 767,543, Cl. 282-27.500.
Spaulding, James R., to General Motors Corporation. Temperature compensated internal combustion engine ignition spark vacuum advance system. 4,112,891, Cl. 123-117.00A.
Spaulding, Tedford Hollace, to Bunker Ramo Corporation. Insulation-piercing contact. B 756,497, Cl. 339-97.00R.
Spence, J. Ronald, to Standard Oil Company (Indiana). Antistatic additives. B 810,291, Cl. 44-72.000.
Spencer, Boyd La Russell, to Spencer Heads, Inc. Firing deck insert for internal combustion engines. 4,112,906, Cl. 123-191.00A.
Spencer, David R.: *See*—
Goldsborough, Robert R.; Spencer, David R.; and West, Samuel F., B 176,890, Cl. 343-112.00S.
Spencer Heads, Inc.: *See*—
Spencer, Boyd La Russell, 4,112,906, Cl. 123-191.00A.
Spencer, Lloyd: *See*—
Christy, Mark H.; and Spencer, Lloyd, B 708,062, Cl. 239-109.000.
Spengler, Hans; Bucksch, Gunter; and Morgenstern, Manfred, to Rutgerswerke Aktiengesellschaft. Process for the continuous production of indene resins. B 704,600, Cl. 526-64.000.
Sperry Rand Corporation: *See*—
Lund, Roger Edward, B 786,316, Cl. 365-2.000.
Phillips, Edwin R., B 486,245, Cl. 271-264.000.
Spiers, Dennis D. Sheet sling. B 759,078, Cl. 224-45.00R.
Spies, Hans: *See*—
Held, Manfred; and Spies, Hans, 4,112,844, Cl. 102-19.200.

Spiller, Herbert A., to Monsanto Company, St. Louis, Missouri. Method for treating polyester filaments. 4,112,668, Cl. 57-157.00S.

Spirig, Ernst. Water decomposing apparatus. B 765,677, Cl. 204-230.000.

Spork, Helmut: *See—*
Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, B 808,767, Cl. 260-448.20E.

Sprague Electric Company: *See—*
Randall, John J., Jr.; and Bernard, Walter J., B 791,656, Cl. 204-33.000.

SPS Technologies, Inc.: *See—*
Dey, Ervin J., 4,112,993, Cl. 151-41.740.

Stach, Kurt, deceased (by Plattner, Werner, executor); Bosies, Elmar; Heerdt, Ruth; Kuhnle, Hans-Frieder; and Schmidt, Felix Helmut, to Boehringer Mannheim GmbH. Hypoglycemically and hypolipidemically active derivatives of phenyl-alkane-carboxylic acids. B 674,993, Cl. 424-272.000.

Stach, Leonard J.; Hotz, Roger D.; and Richter, Sidney B., to Velsicol Chemical Company. Dioxolane substituted amides. B 784,212, Cl. 71-88.000.

Staendeke, Horst; Dany, Franz-Josef; Kandler, Joachim; Auel, Theodor; and Kloss, Werner, to Hoechst Aktiengesellschaft. Stabilized red phosphorus and process for making it. B 815,160, Cl. 423-265.000.

Stahlecker, Fritz; and Stahlecker, Hans. Open end spinning unit with a braking device. 4,112,659, Cl. 57-58.890.

Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Stahlecker, Hans, 4,112,659, Cl. 57-58.890.

Staines, Robert: *See—*
Sikli, Bert J., B 781,545, Cl. 187-18.000.

Stalego, Charles J., to Owens-Corning Fiberglas Corporation. Apparatus for supplying glass bodies to glass melters. B 758,109, Cl. 65-11.00R.

Stamicarbon, B.V.: *See—*
Klaasen, Dirk, B 709,080, Cl. 422-132.000.

Stamicarbon, N.V.: *See—*
Geus, John W., B 663,106, Cl. 252-454.000.

Stampfli, Harald, to Lucifer S.A. Control system for an electromagnet. B 718,545, Cl. 361-154.000.

Standard Havens, Inc.: *See—*
Bundy, Richard P., B 827,942, Cl. 55-96.000.

Standard Oil Company, The: *See—*
White, James F.; and Applequist, Michael D., B 748,081, Cl. 562-535.000.

Standard Oil Company (Indiana): *See—*
Richardson, Eugene E.; and Sidorowicz, Frank, B 741,842, Cl. 260-505.00S.
Sabol, Albert R.; and Petrellis, Nicolas C., B 773,346, Cl. 252-32.70E.
Spence, J. Ronald, B 810,291, Cl. 44-72.000.

Stang, Peter L.: *See—*
Van Ornum, Joel V.; and Stang, Peter L., B 595,351, Cl. 260-876.00B.

Staniland, Philip Anthony, to Imperial Chemical Industries Limited. Aromatic polymer production. B 767,333, Cl. 528-481.000.

Staniland, Philip Anthony: *See—*
Rose, John Brewster; and Staniland, Philip Anthony, B 810,355, Cl. 528-126.000.

Stanley, William L.: *See—*
Masri, Merle S.; Randall, Virginia G.; and Stanley, William L., B 827,659, Cl. 195-63.000.

Stapleton, Harold Reginald, to W. Vinten Limited. Tilt mounting heads. B 757,933, Cl. 248-183.000.

Stapp, Paul R., to Phillips Petroleum Company. Process for preparing diacyloxy olefins. B 551,834, Cl. 560-246.000.

Star Manufacturing Company of Oklahoma: *See—*
Simpson, Harold G., 4,112,632, Cl. 52-11.000.

Staub, John W. Gun recoil reducer. 4,112,605, Cl. 42-1.00V.

Stauffer Chemical Company: *See—*
Chen, Kon S.; and Majewski, Helmut W., B 838,510, Cl. 106-97.000.

Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., to Chevron Research Company. Carboxylic acid-containing wax fluxes. B 811,504, Cl. 148-23.000.

Stayner, Robert A.; Fox, Richard C.; and Jones, Thornton K., to Chevron Research Company. Wax flux compositions. B 811,505, Cl. 148-23.000.

Stearns, David Burrell: *See—*
Rollo, Anita Hand; and Stearns, David Burrell, B 749,585, Cl. 210-22.00A.

Stearns, Richard S.: *See—*
Thompson, Robert M.; and Stearns, Richard S., B 777,999, Cl. 260-857.0TW.

Steel, Paul Franklin, to Teledyne Acoustic Research. Input filtering apparatus for loudspeakers. B 678,461, Cl. 179-1.0VL.

Steer, Philip James: *See—*
Carter, Michael Charles; and Steer, Philip James, B 757,024, Cl. 364-415.000.

Stein Industrie: *See—*
Deruelle, Jean, B 760,140, Cl. 431-5.000.

Steinberg, Bernard J.: *See—*
Snyder, John M., 4,112,542, Cl. 16-114.00R.

Steiner, Edwin C.: *See—*
Trucks, Roger O.; and Steiner, Edwin C., B 437,425, Cl. 260-338.000.

Steiner, H. Karl. Torch igniter. B 761,667, Cl. 431-128.000.

Steiner, John E., to United States Steel Corporation. Wire-wrapped cylindrical prestressed structures. B 710,952, Cl. 220-71.000.

Steinfeld, Horst E.; and Mathes, Dieter, to Hoesch Werke Aktiengesellschaft. Resilient rail connection. B 762,347, Cl. 238-349.000.

Stemmann, Karl; and Holtmeier, Gerhard, to August Stemmann OHG. Method of and apparatus for regulating the brush contact pressure of pantograph assemblies. B 688,269, Cl. 191-67.000.

Stendel, Wilhelm: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Homeyer, Bernhard; Behrenz, Wolfgang; Hammann, Ingeborg; and Stendel, Wilhelm, B 645,128, Cl. 424-200.000.

Stephens, Donald Harrison, to Bourns, Inc. Worm gear drive and ratchet system. B 878,191, Cl. 338-174.000.

Sterling Drug Inc.: *See—*
Surrey, Alexander R.; and Collins, Joseph C., B 831,942, Cl. 260-558.00D.

Stevens, Richard Frederick: *See—*
Gates, John William Charles; Hall, Roy Geoffrey Noel; Ross, Ian Norman; and Stevens, Richard Frederick, B 700,037, Cl. 356-110.000.

Stewart, Alan; and Majefski, Richard Lee, to Shakespeare of Arkansas, Inc. Device for electronic direction control of trolling motors. B 744,337, Cl. 318-257.000.

Stewart, David E., to Empire Metal Products Corp. Roller assembly for sliding screen door, and the like. 4,112,622, Cl. 49-421.000.

Stiles, Kenneth M., to Air Logistics Corporation. Fiber reinforced optical fiber cable. B 600,202, Cl. 350-96.230.

Still, Robert C., to New Concepts, Inc. Replaceable one piece liner for a gate valve. 4,112,969, Cl. 137-454.200.

Stiltz, Erwin; Hoyer, Rudolf; and Lindenmayer, Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Hammer drill with drive and percussion elements accommodated in a cylinder. B 789,680, Cl. 173-116.000.

Stockel, Dieter; and Schneider, Friedrich, to Rau, G. Spark plugs for internal combustion engines. 4,112,905, Cl. 123-169.0EL.

Stokes, Daniel F.: *See—*
Soja, Lawrence M.; Stokes, Daniel F.; and Beile, Richard W., B 762,874, Cl. 206-602.000.

Stokker, Gerald E.: *See—*
Smith, Robert L.; Stokker, Gerald E.; and Cragoe, Edward J., Jr., B 833,930, Cl. 424-303.000.

Stoll, Max: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., B 825,111, Cl. 426-536.000.

Stoller, Frederick L., to Phillips Petroleum Company. Method and apparatus useful in control of edge uniformity in nonwoven fabrics. B 723,394, Cl. 264-280.000.

Stone, Alan J.: *See—*
Tertinek, Christian T.; and Stone, Alan J., B 829,581, Cl. 404-113.000.

Stone Construction Equipment Inc.: *See—*
Tertinek, Christian T.; and Stone, Alan J., B 829,581, Cl. 404-113.000.

Stone Container Corporation: *See—*
Soja, Lawrence M.; Stokes, Daniel F.; and Beile, Richard W., B 762,874, Cl. 206-602.000.

Stoneberg, William A.: *See—*
Maass, Edward A.; and Stoneberg, William A., 4,112,598, Cl. 35-53.000.

Storace, Anthony, to Pitney-Bowes, Inc. Null transducer for an analytical balance. B 807,393, Cl. 177-211.000.

Stork Amsterdam B.V.: *See—*
Witte, Johan Frederik, 4,112,836, Cl. 99-483.000.

Stotz, Manfred: *See—*
Kohler, Werner; Drucker, Gerhard; Kiess, Ulrich; and Stotz, Manfred, B 717,682, Cl. 429-78.000.

Stournas, Stamoulis; and Heiba, El Ahmadi I., to Mobil Oil Corporation. Oil recovery by surfactant waterflooding. B 770,164, Cl. 252-8.55D.

Stout, Daniel W. Laser drilling method and system of fossil fuel recovery. B 675,582, Cl. 175-11.000.

Stovall, Ronald J.: *See—*
Benham, Harold L.; Clark, Steven D.; Huffman, Hubert L.; and Stovall, Ronald J., B 806,799, Cl. 320-39.000.

Strandly, Ingvald: *See—*
Bugge, Hans Jorgen; Strandly, Ingvald; and Swanberg, Carl Olof, 4,112,982, Cl. 139-425.00A.

Strange, Delbert D.; and Hunts, Ronald M., to Manufacturing Approaches & Total Concepts, Inc. Automatic dadoing machine. 4,112,986, Cl. 144-323.000.

Strathearn Audio Limited: *See—*
McLean, Graham Wilson; and Holt, David, B 797,252, Cl. 310-163.000.

Strehlke, Gunter; and Osterburg, Gunther, to Deutsche Texaco Aktiengesellschaft. Extractive distillation of acetone. B 547,846, Cl. 260-593.00P.

Strojny, Edwin J.; Friedli, Hans R.; and Wing, Milton S., to Dow Chemical Company, The. Catalyst for and method of producing maleic anhydride. B 828,409, Cl. 260-346.750.

Stroup, Steven L.: *See—*
Franks, Lawrence A.; Stroup, Steven L.; and Perry, James E., 4,112,794, Cl. 82-64.000.

Stuart, Fred E., Sr. Nozzle for rotary filter pipe. B 736,475, Cl. 239-533.130.

Stuart, Linden, Jr.; and Davis, Harry Robert, to Stuart Steel Protection

Corporation. Pipe joint wrapping machine. B 820,292, Cl. 156-392.000.

Stuart Steel Protection Corporation: *See—*
Stuart, Linden, Jr.; and Davis, Harry Robert, B 820,292, Cl. 156-392.000.

Stubbs, Elmer L., to Thermatron, Inc. Microwave heating method and apparatus. B 704,520, Cl. 219-10.55M.

Studiengesellschaft Kohle mbH: *See—*
Lehmkuhl, Herbert; and Rabet, Farroch, B 711,742, Cl. 252-363.500.

Sturm, Michael R. Hood for glass furnace gathering hole. B 833,264, Cl. 65-324.000.

Sturm, Warren A.: *See—*
Swinehart, Frank, B 633,870, Cl. 179-179.000.

Suda, Seiji: *See—*
Sugiura, Noboru; and Suda, Seiji, 4,112,903, Cl. 123-148.00E.

Sueyoshi, Akiko: *See—*
Oka, Shoji; Murakami, Ryoichi; and Sueyoshi, Akiko, B 791,470, Cl. 148-6.15R.

Suga, Shigeru. Electrode operating mechanism for carbon arc lamp. B 805,577, Cl. 314-134.000.

Sugavanam, Balsubramanyan: *See—*
Shephard, Margaret Claire; Sugavanam, Balsubramanyan; Worthington, Paul Anthony; Collins, David John; and Griffin, David, B 750,017, Cl. 71-92.000.

Sugimura, Sadao: *See—*
Matsui, Takashi; Sugimura, Sadao; and Noo, Kunio, B 703,421, Cl. 264-230.000.

Sugiura, Akio: *See—*
Nojiri, Tadao; Sugiura, Akio; and Nomura, Masahiro, B 756,699, Cl. 235-464.000.

Sugiura, Katuaki: *See—*
Suzuki, Yoshihisa; Sugiura, Katuaki; Suzuki, Osamu; and Tashiro, Ichiro, 4,112,661, Cl. 57-34.00R.

Sugiura, Noboru; and Suda, Seiji, to Hitachi, Ltd. Ignition system for an internal combustion engine. 4,112,903, Cl. 123-148.00E.

Sugiyama, Jun: *See—*
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, B 812,737, Cl. 260-874.000.

Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, to Fuji Photo Film Co., Ltd. Method of forming photographic line and half-tone images. B 231,001, Cl. 96-60.00R.

Sugiyama, Nobuo: *See—*
Sugiyama, Mitsunori; Ishiguro, Shoji; Sugiyama, Nobuo; Iijima, Yoo; Okutsu, Eiichi; Iwano, Haruhiko; Hosoya, Katsumi; and Hara, Hikoharu, B 231,001, Cl. 96-60.00R.

Sullivan, Gerald Leslie. "Strapdown" induction compass transmitter with means to compensate for heading errors during turns and during dives and climbs due to the vertical component of the Earth's magnetic field and due to two cycle error. 4,112,755, Cl. 73-178.00R.

Sullivan, Kevin J., to Corning Glass Works. Blood sample container having an anticoagulant coating of polyvinyl pyrrolidone and a salt of ethylene diamine tetracetate. 4,112,925, Cl. 128-2.00F.

Sullivan, Thomas A. Roller-colloid mill. B 793,733, Cl. 241-43.000.

Sulzer Brothers Limited: *See—*
Bader, Hartmann, 4,112,980, Cl. 139-92.000.
Sekoulov, Ivan; and Muller, Wolf-Rudiger, B 771,958, Cl. 210-17.000.
Sekoulov, Ivan; and Muller, Wolf-Rudiger, B 771,959, Cl. 210-17.000.

Suminsby, John. Pendulous induction compass transmitter including means external to the transmitter to compensate for heading errors in turns due to the vertical component of the Earth's magnetic field and due to two cycle error. 4,112,754, Cl. 73-178.00R.

Sumitomo Chemical Company, Limited: *See—*
Kojimoto, Susumu; Sato, Takami; and Mori, Toshio, B 723,977, Cl. 264-89.000.
Oshio, Hiromichi; Konishi, Hiroyuki; Matsumura, Shiunzi; Ishikawa, Kikuichi; and Yoneyama, Eiichi, B 776,618, Cl. 71-76.000.
Sano, Takezo; Kobayashi, Akira; and Inoue, Haruo, B 699,255, Cl. 521-29.000.
Sekihara, Takeshi; Emura, Tomoyuki; and Murashige, Masayuki, B 874,748, Cl. 526-74.000.
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, B 768,875, Cl. 424-225.000.

Sumitomo Electric Industries, Ltd.: *See—*
Doi, Kaname, B 804,572, Cl. 303-24.00F.
Okita, Koichi, B 823,474, Cl. 428-290.000.
Shibano, Yoshizo, B 573,885, Cl. 343-741.000.
Yamaguchi, Yasuo, 4,112,725, Cl. 72-128.000.

Sumitomo Metal Industries, Ltd.: *See—*
Nakada, Tetsuro; Shimizu, Makoto; and Yoshinaga, Mayumi, B 864,252, Cl. 266-137.000.

Summers, Ernest Moreland: *See—*
Henry, Russell Alger; and Summers, Ernest Moreland, B 799,772, Cl. 427-290.000.

Sun Ventures, Inc.: *See—*
Thompson, Robert M.; and Stearns, Richard S., B 777,999, Cl. 260-857.0TW.

Sundman, Frey Viking, to A. Ahlstrom Osakeyhtio. Method and means for drying a fibre material containing cellulose. 4,112,587, Cl. 34-12.000.

Sundstrand Corporation: *See—*
Davis, Gerald L.; and Scott, Timothy C., 4,112,974, Cl. 137-625.290.

Suntech, Inc.: *See—*
Lauer, James L.; and Peterkin, Melvin E., B 791,089, Cl. 356-70.000.
Neinast, Gary S., B 714,208, Cl. 254-134.500.
Norton, Richard V., B 776,452, Cl. 260-465.00D.

Supra Products, Inc.: *See—*
Bradley, Terrag W., 4,112,717, Cl. 70-63.000.

Surrey, Alexander R.; and Collins, Joseph C., to Sterling Drug Inc. N-(Dichloroacetyl) diamine compounds and process of preparing same. B 831,942, Cl. 260-558.00D.

Susa, Ermanno: *See—*
Mayr, Adolfo; Davoli, Velmore; Leccese, Antonio; and Susa, Ermanno, B 733,709, Cl. 252-429.00C.

Sutherland, George K.: *See—*
Zelinka, Richard J.; and Sutherland, George K., B 734,755, Cl. 219-471.000.

Sutton, James Alton, Jr. Ventilation system for poultry or livestock house. B 716,158, Cl. 236-46.00A.

Sutton, Stephen J.; Holen, J. Robert; and Creager, John E., to General Motors Corporation. Fuel level sender with molded plastic case. B 854,711, Cl. 338-33.000.

Suwa, Hiroyuki: *See—*
Okunishi, Hiromu; Nakaji, Hideki; Suwa, Hiroyuki; and Sato, Hideaki, 4,112,732, Cl. 72-334.000.

Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Motion picture projector. B 736,223, Cl. 352-194.000.

Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, to Director-General Agency of Industrial Science and Technology. Steam reforming reactor. B 775,373, Cl. 422-197.000.

Suzuki, Hiroshige; Horie, Eizi; and Nagashima, Hideo, to Agency of Industrial Science and Technology, The President of the. Wall structure of hot fluid chamber. 4,112,648, Cl. 52-508.000.

Suzuki, Koichi; Suzuki, Shigeru; and Suzuki, Minoru, to Ricoh Company, Ltd. Apparatus for controlling the toner concentration of a developer used in a dry type developing system. 4,112,867, Cl. 118-7.000.

Suzuki, Minoru: *See—*
Suzuki, Koichi; Suzuki, Shigeru; and Suzuki, Minoru, 4,112,867, Cl. 118-7.000.

Suzuki, Osamu: *See—*
Suzuki, Yoshihisa; Sugiura, Katuaki; Suzuki, Osamu; and Tashiro, Ichiro, 4,112,661, Cl. 57-34.00R.

Suzuki, Shigeru: *See—*
Suzuki, Koichi; Suzuki, Shigeru; and Suzuki, Minoru, 4,112,867, Cl. 118-7.000.

Suzuki, Shoji: *See—*
Koike, Hiroshi; Suzuki, Shoji; and Asakawa, Takeki, B 778,240, Cl. 350-269.000.

Suzuki, Shosuke: *See—*
Matsumoto, Masayasu; Iida, Kazuyoshi; Kondo, Yoshikazu; and Suzuki, Shosuke, B 730,115, Cl. 181-284.000.

Suzuki, Sukenori: *See—*
Fujita, Masanori; and Suzuki, Sukenori, B 751,730, Cl. 174-88.00R.

Suzuki, Tadashi: *See—*
Ookubo, Toshio; Nishino, Atsushi; and Suzuki, Tadashi, B 721,545, Cl. 422-177.000.

Suzuki, Toshihisa: *See—*
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.

Suzuki, Yasoji, to Tokyo Shibaura Electric Co., Ltd. Counter provided with complementary field effect transistor inverters. B 735,133, Cl. 307-225.00C.

Suzuki, Yasoji; and Ochii, Kiyofumi, to Tokyo Shibaura Electric Co., Ltd. Semiconductor memory device to reduce parasitic output capacitance. B 777,663, Cl. 365-189.000.

Suzuki, Yoshihisa; Sugiura, Katuaki; Suzuki, Osamu; and Tashiro, Ichiro, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Open-end spinning machine and a method of stopping the same. 4,112,661, Cl. 57-34.00R.

Svedas, Stanley; and Shah, Champak C., to Turtle Wax, Inc. Polished composition containing microcrystalline wax. B 649,078, Cl. 260-23.00R.

Svenska Dataregister Aktiebolag: *See—*
Englund, Gosta Roland, 4,112,840, Cl. 101-93.150.

Svenska Rotor Maskiner Aktiebolag: *See—*
Schibbye, Hjalmar; and Eriksson, Lennart, 4,112,701, Cl. 62-84.000.

Svenska Traforskningsinstitutet: *See—*
Johansson, Ingvar, B 822,517, Cl. 156-335.000.
Nyren, Jan O.; Nordin, Soren B.; and Flodman, Leif A., B 761,209, Cl. 162-127.000.

Svensson, Einar Gustav-Vilhelm, to Wallbergs Fabriks AB. Apparatus for forming a joint for wire cloth. 4,112,570, Cl. 29-241.000.

Swanberg, Carl Olof: *See—*
Bugge, Hans Jorgen; Strandly, Ingvald; and Swanberg, Carl Olof, 4,112,982, Cl. 139-425.00A.

Swinehart, Frank, to Sturm, Warren A. Hand held communications microphone. B 633,870, Cl. 179-179.000.

Swiss Aluminium Ltd.: *See—*
Dore, James E., B 835,649, Cl. 266-227.000.
Fister, Julius C., Jr.; Breedis, John F.; and Pryor, Michael J., B 784,155, Cl. 75-142.000.

Swodenk, Wolfgang: *See—*
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, B 678,822, Cl. 260-348.250.

SWS Silicones Corporation: *See—*
Lewis, Richard Newton, B 769,062, Cl. 260-37.0SB.

Sybron Corporation: *See—*
Brockway, Charles E., B 861,351, Cl. 297-408.000.

Sylvester, Bruce J.; and Sylvester, Roger P., to J. G. Sylvester Associates, Inc. Fillet weld inspection system. 4,112,775, Cl. 73-627.000.

Sylvester, Roger P.: *See—*
Sylvester, Bruce J.; and Sylvester, Roger P., 4,112,775, Cl. 73-627.000.

Syracuse, Donald C.: *See—*
Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., 4,112,952, Cl. 128-418.000.

Syred, Nicholas; Grant, John; and Sidhu, Baldip Singh. Vortex diodes. 4,112,977, Cl. 137-812.000.

Sys-Tec, Inc.: *See—*
Zelinka, Richard J.; and Sutherland, George K., B 734,755, Cl. 219-471.000.

Systems, Science and Software: *See—*
Turner, Philip L., 4,112,738, Cl. 73-32.00R.

Szatmari, Franz: *See—*
Hofmann, Franz; and Szatmari, Franz, B 729,979, Cl. 366-56.000.

Szema, Li C.: *See—*
Lee, Richard M.; and Szema, Li C., B 742,739, Cl. 415-115.000.

Szentivanyi, Matyas: *See—*
Bernath, Gabor; Gera, Lajos; Gondos, Gyorgy; Ecsery, Zoltan; Hermann nee Voros, Judit; Szentivanyi, Matyas; and Janvari, Erzsebet, nee Kanyo, B 728,459, Cl. 424-251.000.

Tager, Semen Alexandrovich: *See—*
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, B 702,208, Cl. 423-131.000.

Taguchi, Tetsuya: *See—*
Tsunekawa, Tokuichi; and Taguchi, Tetsuya, B 703,962, Cl. 250-214.00R.

Taisho Pharmaceutical Co., Ltd.: *See—*
Kamano, Yoshiaki; Michishita, Kazuhiko; Seki, Teruya; and Tanaka, Ichiro, B 671,693, Cl. 260-397.450.

Takahashi, Akio: *See—*
Oshima, Kathuhide; Takasaki, Haruyuki; and Takahashi, Akio, B 779,560, Cl. 204-55.00Y.

Takahashi, Kiyoshi: *See—*
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, B 736,223, Cl. 352-194.000.

Takahashi, Sankichi: *See—*
Koseki, Yasuo; Takahashi, Sankichi; and Nakaoka, Azuma, B 748,762, Cl. 210-82.000.

Takaiti, Osasi: *See—*
Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, B 793,920, Cl. 424-274.000.

Takasaki, Haruyuki: *See—*
Oshima, Kathuhide; Takasaki, Haruyuki; and Takahashi, Akio, B 779,560, Cl. 204-55.00Y.

Takase, Hirobumi; and Utsunomiya, Yutaka, to NHK Spring Co., Ltd. NC Coil spring manufacturing apparatus. 4,112,721, Cl. 72-12.000.

Takemura, Katsuaki: *See—*
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.

Takenoya, Hideaki: *See—*
Kakinuma, Toshihide; Kume, Toshiaki; Takenoya, Hideaki; Makabe, Hachiro; and Watanabe, Kazuo, 4,112,858, Cl. 112-158.00E.

Takeshita, Tetsuo: *See—*
Mukaemachi, Takuji; Takeshita, Tetsuo; and Enami, Shiroh, B 775,619, Cl. 179-18.0ES.

Takimoto, Hiroyuki: *See—*
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, B 736,223, Cl. 352-194.000.

Takimoto, Masatami; and Mizutani, Koichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with charcoal canister. 4,112,898, Cl. 123-136.000.

Takiura, Mamoru; and Hayashizaki, Yoshihiro, to Ikegai Tekko Kabushiki Kaisha. Method of dispersing inorganic additives within extruder. B 773,669, Cl. 264-349.000.

Takizawa, Kazuyuki, to Sony Corporation. Phonograph record player. B 740,306, Cl. 274-15.00R.

Talbott, John W.; and Logan, James D., to Washington State University Research Foundation. Method of forming a composite mat of directionally oriented lignocellulosic fibrous material. B 747,391, Cl. 264-24.000.

Talleres Diesel, S.A.: *See—*
Torralba, Jose Esteban, 4,112,902, Cl. 123-140.0FG.

Tamborini, Ariberto; and Tamborini, Giancarlo. Process of the making of extruded thermoplastic bodies and device for the carrying out of the said process. B 674,566, Cl. 264-173.000.

Tamborini, Giancarlo: *See—*
Tamborini, Ariberto; and Tamborini, Giancarlo, B 674,566, Cl. 264-173.000.

Tamm, Paul Whitfield, to Chevron Research Company. Method for preparing a hydrodesulfurization catalyst. B 496,788, Cl. 252-465.000.

Tamura, Nobuhiro: *See—*
Tanabe, Masanori; Ikeda, Masanori; and Tamura, Nobuhiro, B 786,325, Cl. 560-244.000.

Tanabe, Masanori; Ikeda, Masanori; and Tamura, Nobuhiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing 1,4-diacyloxybutene-2. B 786,325, Cl. 560-244.000.

Tanabe Seiyaku Co. Ltd.: *See—*
Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, B 793,920, Cl. 424-274.000.

Tanabe, Yoshio: *See—*
Koike, Sakae; Matsunami, Shoichi; Goto, Yorinobu; and Tanabe, Yoshio, B 755,936, Cl. 423-235.000.

Tanaka, Akira, to American Safety Equipment Corporation. Safety belt retractor with conjugate return spring means. B 701,504, Cl. 242-107.000.

Tanaka, Eiji: *See—*
Tokumoto, Shin-Ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, B 801,640, Cl. 204-39.000.
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, B 802,487, Cl. 204-39.000.

Tanaka, Ichiro: *See—*
Kamano, Yoshiaki; Michishita, Kazuhiko; Seki, Teruya; and Tanaka, Ichiro, B 671,693, Cl. 260-397.450.

Tanaka, Shinzo; Tsubamoto, Shinichi; Yamashita, Koichi; Eguchi, Tadashi; and Inoue, Kashirou, to Yanagimoto Seisakusho Co., Ltd. Method and apparatus for collectively sampling a plurality of gaseous phases in desired proportions for gas analysis or other purposes. B 709,088, Cl. 23-232.00R.

Tanaka, Toshie, to Nifco Inc. Plastic fixing device. 4,112,815, Cl. 85-80.000.

Tanaka, Tsutomu: *See—*
Izawa, Shinichi; Sugiyama, Jun; Tanaka, Tsutomu; Nakanishi, Atsuo; and Saito, Toranosuke, B 812,737, Cl. 260-874.000.

Tanner, Lee E.; and Ray, Ranjan, to Allied Chemical Corporation. Zirconium alloys containing transition metal elements. B 823,080, Cl. 75-177.000.

Tao, Frank F.: *See—*
Gorbaty, Martin L.; Tao, Frank F.; and Maa, Peter S., B 693,830, Cl. 208-8.000.

Tarrant, Paul: *See—*
Schuman, Paul D.; Tarrant, Paul; Warner, Dale A.; and Westmoreland, Geraldine, B 665,865, Cl. 544-303.000.

Tasch, Al F., Jr.: *See—*
Fu, Horng-sen; Holloway, Thomas C.; Tasch, Al F., Jr.; and Chatterjee, Pallab K., 4,112,575, Cl. 29-577.00C.

Tashiro, Ichiro: *See—*
Suzuki, Yoshihisa; Sugiura, Katuaki; Suzuki, Osamu; and Tashiro, Ichiro, 4,112,661, Cl. 57-34.00R.

Tassano, Peter Francis, to Lucas Industries Limited. Apparatus for detecting water in oil. 4,112,744, Cl. 73-61.10R.

Tate, Leslie R.: *See—*
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., B 779,038, Cl. 423-308.000.

Tatsuzawa, Yoshinobu: *See—*
Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, B 626,098, Cl. 325-320.000.

Taurus Gumiipari Vallalat: *See—*
Bogatirev, Nikolai Tikhonovich; Filianovich, Jevgeny Grigorievich; Ignatyev, Alexandr Dmitrievich; Merkulov, Alexandr Nikolaevich; Ponomarenko, Jury Filippovich; Shein, Jury Gheorghievich; Baso, Jozsef; Frituz, Bela; Korbuly, Jozsef; Nagy, Sandor; Mikes, Sandor; and Pap, Zsolt, B 787,511, Cl. 285-137.00R.

Taya, Hiroshi: *See—*
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, B 768,875, Cl. 424-225.000.

Taylor, Alfred James: *See—*
Lumby, Roland John; North, Bernard; and Taylor, Alfred James, B 802,172, Cl. 106-73.400.

Taylor, Norman C.: *See—*
Skinner, Leon S.; and Taylor, Norman C., 4,112,922, Cl. 126-271.000.

Taylor, Robert Coleman, to Atlantic Richfield Company. Frothing composition for gypsum dispersions. B 711,761, Cl. 252-61.000.

Taylor-Winfield Corporation, The: *See—*
Toma, Charles A.; and Haessly, Walter F., B 678,153, Cl. 219-97.000.

TDK Electronics Co., Ltd.: *See—*
Tokuoka, Yasumichi; and Fukuda, Kazumasa, B 744,115, Cl. 148-105.000.

Technical Plastics Corporation: *See—*
Hanson, Paul D., Sr., 4,112,638, Cl. 52-169.120.

Technicon Instruments Corporation: *See—*
Burns, Donald Arthur; and Fontanilles, Henry, B 749,558, Cl. 356-36.000.

Tedeschi, Anthony, to Western Electric Co., Inc. Mercury-wetted sealed contact switch. B 793,325, Cl. 200-234.000.

Teger, Gerhard: *See—*
Lippacher, Wolfgang; and Teger, Gerhard, B 791,950, Cl. 408-241.00S.

Teil, Yves: *See—*
Casalis, Jean-Arnaud; Teil, Yves; and Motte, Raymond, B 713,371, Cl. 210-219.000.

Teledyne Acoustic Research: *See—*
Steel, Paul Franklin, B 678,461, Cl. 179-1.0VL.

Telefonaktiebolaget L M Ericsson: *See—*
Martensson, Folke Lennart, B 755,035, Cl. 328-111.000.
Samuelsson, Kurt Anders, B 757,863, Cl. 179-15.0AN.

Telephone Cables Limited: *See—*
Haines, Ernest Martin, B 664,706, Cl. 350-96.290.

Teletype Corporation: *See—*
Geis, David G.; and Hodne, Ingard B., B 816,823, Cl. 335-270.000.

TelTec, Incorporated: *See—*
Luetzow, Edwin J., B 695,514, Cl. 29-630.00B.

Temme, Helmut, to Gewerkschaft Eisenhutte Westfalia. Scraper chain assemblies. B 769,094, Cl. 198-731.000.

Tennessee Valley Authority: *See—*
McCullough, John F.; Phillips, John F., Jr.; and Tate, Leslie R., B 779,038, Cl. 423-308.000.

Teodorescu, Constantin, to Institutul National Pentru Creatie Stiintifica Si Tehnica - Increst. Method of and device for attenuating the noise radiated by gas jets. B 678,728, Cl. 181-220.000.

Terada, Yasuhiko; Yasuda, Jun; and Kuriyama, Masao, to Shikibo Limited. Method for dyeing cellulose fibers by disperse dyes. B 661,825, Cl. 8-120.000.

Teradyne, Inc.: *See—*
Ashdown, Glynn R.; McCartney, Thomas; and Holmes, Bruce, B 622,054, Cl. 179-175.30R.

Teraji, Tsutomu: *See—*
Kamiya, Takashi; Teraji, Tsutomu; Hashimoto, Masashi; Nakaguti, Osamu; and Oku, Teruo, B 640,910, Cl. 544-16.000.

Teranishi, Takanori; and Nakashima, Toshihiko, to Nippondenso Co., Ltd. Control system for a motor having a shunt field winding. B 788,429, Cl. 318-421.000.

Terasawa, Yoshio; and Kimura, Shin, to Hitachi, Ltd. Semiconductor controlled rectifier having an auxiliary region with localized low resistance paths to the control gate. B 652,662, Cl. 357-38.000.

Terragni, Marco. Extruder and sizer apparatus for hollow plastic sections. B 680,269, Cl. 425-325.000.

Terry, Ruel Carlton, to In Situ Technology, Inc. Recovering uranium from coal in situ. B 797,536, Cl. 299-4.000.

Tertinek, Christian T.; and Stone, Alan J., to Stone Construction Equipment Inc. Plate type compactor. B 829,581, Cl. 404-113.000.

Tetra Pak International AB: *See—*
Carlsson, Lars Christer, B 808,690, Cl. 206-611.000.

Tetradis, Constantinos. Handle for bags particularly of net or plastic material. 4,112,541, Cl. 16-114.00R.

Tews, Jan Henryk. Two-cycle engine and piston. 4,112,882, Cl. 123-47.00A.

Texaco Development Corporation: *See—*
Gettert, Hans; Jeck, Arnulf; and Werner, Dietmar, B 861,744, Cl. 48-197.00R.
Schulze, Heinz; and Waddill, Harold G., B 743,818, Cl. 528-94.000.

Texaco Inc.: *See—*
Herbstman, Sheldon; Webb, Allen N.; and Estes, John H., B 746,766, Cl. 252-442.000.
Ishiwata, Samford P., 4,112,760, Cl. 73-299.000.
Ledoux, Will A.; Schoen, William; and Kumar, Atul, B 738,494, Cl. 166-275.000.
Rao, Babu Y.; Nolan, John T., Jr.; and Estes, John H., B 774,099, Cl. 260-683.680.

Texas Alkyls, Inc.: *See—*
Malpass, Dennis B.; and Yeargin, G. Scott, B 805,194, Cl. 260-606.50P.

Texas Instruments Incorporated: *See—*
Fu, Horng-sen; Holloway, Thomas C.; Tasch, Al F., Jr.; and Chatterjee, Pallab K., 4,112,575, Cl. 29-577.00C.
Grenier, Aime J., B 755,516, Cl. 335-42.000.
Grenier, Aime J., B 755,763, Cl. 335-8.000.
Pejouhy, Radi, B 728,350, Cl. 337-97.000.

Textron Inc.: *See—*
Moertel, George B., 4,112,555, Cl. 24-205.13C.

Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Shimizu, Masami; Yoshikawa, Ryoichi; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Photographic camera with an operation mode display device. B 758,200, Cl. 354-238.000.

Th. Goldschmidt AG: *See—*
Laqua, Arnold; and Holtschmidt, Ulrich, B 793,315, Cl. 260-29.40R.

Thackston, Clyde David; and Alexander, Robert H., to Rockwell International Corporation. Torque wrench air shut-off. B 811,423, Cl. 192-150.000.

Thayer, Orla E. Axial flow valve. 4,112,806, Cl. 84-390.000.

Thely, Maurice H.: *See—*
Estevenel, Yvette Fr. M. J.; Thely, Maurice H.; and Coulon, Wladimir A., B 767,885, Cl. 264-113.000.

Thermatool Corp.: *See—*
DuBosque, Clayton, Jr.; Rudd, Wallace C.; and Allen, Richard J., 4,112,566, Cl. 29-157.30C.

Thermatron, Inc.: *See—*
Stubbs, Elmer L., B 704,520, Cl. 219-10.55M.

Theunissen, Eos Lee, to Sidley, Manfred. Dispensing device for web material in roll form. B 744,544, Cl. 242-55.300.

Theurer, Josef; Praschl, Wilhelm; and Riessberger, Klaus, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft M.B.H. Load handling vehicle with hydraulic torsion transmitting devices. B 672,276, Cl. 212-28.000.

Thiry, Geza A. Food processing apparatus. 4,112,834, Cl. 99-450.100.

Tholen, Paul, to Klockner-Humboldt-Deutz Aktiengesellschaft. Multiple working chamber forming combustion machine with exhaust turbo charger. 4,112,684, Cl. 60-606.000.

Thomanek, Franz Rudolf, to Messerschmitt-Bolkow-Blohm Gesellschaft mit Beschrankter Haftung. Warhead with a disintegrating jacket to house several projectiles. 4,112,847, Cl. 102-67.000.

Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., to United States of America, Health, Education and Welfare. Electrode for artificial pacemaker. 4,112,952, Cl. 128-418.000.

Thomas, Herbert: *See—*
Seubert, Jurgen; Thomas, Herbert; and Andrews, Peter, B 742,132, Cl. 424-250.000.

Thomas, Richard J., to Robbins & Myers, Inc. Boltless housing for gear heads and the like. 4,112,786, Cl. 74-606.00R.

Thompson, Arthur David: *See—*
Phillips, Reginald Andrew; Hamilton, Terence; and Thompson, Arthur David, B 734,637, Cl. 299-31.000.

Thompson, James L., to Dow Chemical Company, The. Foaming and silt suspending agent. B 713,168, Cl. 252-8.55C.

Thompson, John; and Pitfield, Adrian, to Wilkinson Sword Limited. Aerosol foams. B 662,266, Cl. 252-90.000.

Thompson, Robert I.: *See—*
Saxe, Robert L.; Thompson, Robert I.; and Forlini, Matthew, B 795,819, Cl. 350-362.000.

Thompson, Robert M.; and Stearns, Richard S., to Sun Ventures, Inc. Copolymer of blocks of random poly(dioxa-amide) and polyamide. B 777,999, Cl. 260-857.0TW.

Thomsen, Eigild S. Pulp press having a planar dewatering disc below an annular press chamber. B 735,906, Cl. 210-152.000.

Thomson-CSF: *See—*
Sarfati, Pierre, B 818,221, Cl. 343-17.2PC.

Thomson, David Summers: *See—*
Jones, Geraint; and Thomson, David Summers, B 747,995, Cl. 424-304.000.

Thorn Domestic Appliances (Electrical) Ltd.: *See—*
Palfrey, Lesley Francis; and Fellows, Ronald John, 4,112,589, Cl. 34-48.000.

Thrower, Herbert T., Jr.; and Wasness, Donald S., to Thrower, Herbert T., Jr. Light modulator system. B 733,321, Cl. 315-226.000.

Thurman, Paul G., to Dare Pafco, Inc. Multi-tray basket. B 796,478, Cl. 312-111.000.

Thyssen Industrie Aktiengesellschaft: *See—*
Hausenblas, Helmut; and Holzforster, Hans-Erich, B 691,978, Cl. 280-705.000.

Tilley, Jefferson Wright: *See—*
Cohen, Michael Robert; Kierstead, Richard Wightman; and Tilley, Jefferson Wright, B 844,570, Cl. 260-565.000.

Timin, Mitchell E., to Airco, Inc. Apparatus and method for storing and transporting substrates in a batch-type vacuum process. B 686,778, Cl. 198-339.000.

Tingler, Kenneth Lloyd: *See—*
Sandhu, Mohammad Akram; and Tingler, Kenneth Lloyd, B 778,635, Cl. 96-67.000.

Tioxide Group Limited: *See—*
Kay, Peter Dunlop, B 774,140, Cl. 260-429.500.

Tippmann, Heinrich; and Huber, Wolfgang, to ITT Industries, Inc. Epicyclic friction transmission with torque-dependent pressure-exerting device. 4,112,787, Cl. 74-798.000.

Tisbo, Cosmo N.; and Tisbo, Thomas A., to Custom Plastics, Inc. Shelving apparatus. 4,112,853, Cl. 108-111.000.

Tisbo, Thomas A.: *See—*
Tisbo, Cosmo N.; and Tisbo, Thomas A., 4,112,853, Cl. 108-111.000.

Titus IV, Theodore: *See—*
Bolick, Fred C., Jr.; and Titus IV, Theodore, B 719,423, Cl. 179-100.1DR.

Tobin, Joseph M., to Westinghouse Electric Corp. Fuel arrangement for high temperature gas cooled reactor. B 646,812, Cl. 176-84.000.

Todd, Estel R.: *See—*
Dirksing, Robert S.; and Todd, Estel R., B 845,064, Cl. 366-167.000.

Tokimoto, Tadashi; Kawaguchi, Kazumasa; Izawa, Junji; and Hiraishi, Yoshinobu, to Komatsu Electronci Metals, Co., Ltd. Method of producing high-purity transparent vitreous silica body. B 733,400, Cl. 423-336.000.

Tokumitsu, Shunji: *See—*
Sato, Toru; Tokumitsu, Shunji; Sakai, Masaaki; Kawasaki, Kazuhiko; Kaimori, Kenichiro; and Oxawa, Mitsuo, B 798,313, Cl. 274-15.00R.

Tokumoto, Shin-Ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and

Tsumori, Toshiro, to Sony Corporation. Electrodeposition process. B 801,640, Cl. 204-39.000.

Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, to Sony Corporation. Method of adjusting a fused salt electrolytic bath. B 802,487, Cl. 204-39.000.

Tokuoka, Yasumichi; and Fukuda, Kazumasa, to TDK Electronics Co., Ltd. Method of preventing deterioration of characteristics of ferromagnetic metal or alloy particles. B 744,115, Cl. 148-105.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Manabe, Kenshi; and Satou, Kouichirou, B 801,254, Cl. 307-279.000.
Suzuki, Yasoji, B 735,133, Cl. 307-225.00C.
Suzuki, Yasoji; and Ochii, Kiyofumi, B 777,663, Cl. 365-189.000.

Tokyo Special Wire Netting Co., Ltd.: *See*—
Ikawa, Reiji, B 809,329, Cl. 261-98.000.

Toma, Charles A.; and Haessly, Walter F., to Taylor-Winfield Corporation, The. Welding machine auxiliary transfer clamp. B 678,153, Cl. 219-97.000.

Tomecek, Jerry J. Antonomic transcutaneous affect device. 4,112,923, Cl. 128-1.300.

Tominaga, Akira, to Toyota Jidosha Kogyo Kabushiki Kaisha. Valve lifter for internal combustion engine. 4,112,884, Cl. 123-90.480.

Tomita, Chuji, to Hitachi Medical Corporation. X-ray apparatus. B 740,720, Cl. 250-439.00R.

Tomy Kogyo Co., Inc.: *See*—
Sano, Hiroshi, 4,112,610, Cl. 46-12.000.

Toplak, Steve. Spinning toy. 4,112,613, Cl. 46-83.000.

Toppan Printing Co., Ltd.: *See*—
Matsunaga, Kazuo; Ishizawa, Hideo; and Kurata, Kenichi, B 735,523, Cl. 96-38.100.

Torpie, John D.: *See*—
Heckman, Raymond F.; and Torpie, John D., B 793,455, Cl. 179-90.00B.

Torr, Ralph Percival; and Beauchamp, Miles Albert, to Andre Rubber Company Limited. Spacing devices for overhead transmission lines. B 765,274, Cl. 174-42.000.

Torralba, Jose Esteban, to Talleres Diesel, S.A. Hydraulic speed control systems for internal combustion engines. 4,112,902, Cl. 123-140.0FG.

Toshio, Iizuka: *See*—
Shogo, Iizuka; Mitsuo, Endo; Mitsugu, Watanabe; Toshio, Iizuka; and Kenji, Usui, B 737,025, Cl. 219-56.000.

Toter-Tee, Inc.: *See*—
Glumac, Nick P., B 708,400, Cl. 214-10.50R.

Totten, George Edward: *See*—
Williams, Thomas Charles; and Totten, George Edward, B 810,785, Cl. 260-448.20B.

Toukan, Sameeh Said: *See*—
Hager, Robert Bonner; Toukan, Sameeh Said; and Walter, Gerald Joseph, B 459,132, Cl. 260-348.430.

Towmotor Corporation: *See*—
Melocik, Grant C., B 813,030, Cl. 307-9.000.

Townsend Engineering Company: *See*—
Townsend, Ray T., 4,112,881, Cl. 123-32.00B.

Townsend, Ray T., to Townsend Engineering Company. Rotary internal combustion engine employing compression ignition. 4,112,881, Cl. 123-32.00B.

Toyo Kohan Co., Ltd.: *See*—
Tsutsui, Nobuyuki; Inui, Tsuneo; and Kawamura, Hiroaki, B 818,099, Cl. 204-37.00T.

Toyo Seikan Kaisha Ltd.: *See*—
Hotta, Hisashi; and Mori, Fumio, B 808,301, Cl. 156-306.000.

Toyo Valve Company, Ltd.: *See*—
Okano, Masao, B 698,800, Cl. 75-156.500.

Toyo Ysushinki Kabushiki Kaisha: *See*—
Hirata, Toshikiyo, B 772,248, Cl. 343-119.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Arai, Hiroshi; and Mori, Mamoru, B 765,392, Cl. 280-747.000.
Goto, Kenji; and Niwa, Takao, 4,112,877, Cl. 123-32.0ST.
Iwata, Toshiharu; Hattori, Tadashi; Mori, Kouichi; and Akiyama, Tomojiro, 4,112,885, Cl. 123-98.000.
Komiyama, Yoshiro; Kondo, Katsumi; Koyama, Mototsugu; Nagaoka, Masaaki; and Uchida, Tsuneo, B 781,408, Cl. 228-176.000.
Miyagi, Hideo, 4,112,678, Cl. 60-276.000.
Nohira, Hidetaka, 4,112,894, Cl. 123-119.00A.
Okabayashi, Keiichi, 4,112,888, Cl. 123-117.00A.
Takimoto, Masatami; and Mizutani, Koichi, 4,112,898, Cl. 123-136.000.
Tominaga, Akira, 4,112,884, Cl. 123-90.480.

Tracy, David J.; and Hoffstadt, Walter F., to GAF Corporation. Process for the preparation of 3-anilino-5-pyrazolones. B 742,058, Cl. 548-365.000.

Transco Products, Inc.: *See*—
Greiser, John W., B 751,712, Cl. 343-895.000.

Trautner, Kersten: *See*—
Hugl, Herbert; Schundehutte, Karl Heinz; Trautner, Kersten; and Wolfrum, Gerhard, B 813,311, Cl. 8-41.00R.

Travis, Brian A., to Datrix Corporation. Digital communication system for transmitting digital information between a central station and a number of remote stations. B 759,774, Cl. 340-151.000.

Trebellas, John C.: *See*—
Rybny, Charles B.; Trebellas, John C.; and Sargent, Donald E., B 568,216, Cl. 204-159.160.

Treille, Pierre Albert Eugene; Moles, Jacques Claude Antoine; Bonnemay, Maurice Gabriel Ernst; Royon, Jean Paul; Levart, Michel Marc; Gaessler, Henri Pierre; and Richard, Yves Robert, to Degremont. Method of measuring the mobility of colloids in an electrical field. B 605,926, Cl. 204-180.00R.

Treplin, Friedrich-Wilhelm; and Borchert, Werner, to Ludwig Taprogge, Reinigungsanlagen fur Rohren-Warmeaustauscher. Apparatus for separating cleaning elements from a fluid. B 781,489, Cl. 165-95.000.

Treuner, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. 7β-[(2-Amino-1,2-dioxoethyl)amino]acyl cephalosporins. B 776,400, Cl. 544-26.000.

Trio Kabushiki Kaisha: *See*—
Sekiguchi, Tadao, B 767,832, Cl. 325-455.000.

Tripp, Luther W. Direct-from-skein yarn feeder. 4,112,711, Cl. 66-1.00A.

Troope, Walter S.; and Lawrence, Jackson, to Cluett, Peabody & Co., Inc. Apparatus for compressively shrinking textile fabrics at high speed. 4,112,559, Cl. 26-18.600.

Trott, Donald E. Casing perforation method and apparatus. B 836,758, Cl. 166-297.000.

Trotta, Robert. Method and apparatus for harnessing the power of moving water. 4,112,686, Cl. 60-639.000.

Troy, M. Frank, to Vapor Corporation. Mechanical stored energy positioning actuator. B 748,058, Cl. 185-40.00R.

Trucks, Roger O.; and Steiner, Edwin C., to Dow Chemical Company, The. Process for preparation of (poly)cyclic polyethers. B 437,425, Cl. 260-338.000.

TRW Inc.: *See*—
McKee, William H., B 736,895, Cl. 339-91.00R.
McKee, William H., B 736,942, Cl. 339-91.00R.

Tryciecky, Teodozij: *See*—
Shanker, Irvin Paul; and Tryciecky, Teodozij, 4,112,953, Cl. 128-419.00P.

Tsao, Utah, to Lummus Company, The. Hydrogen chloride recovery. B 673,095, Cl. 260-659.00A.

Tsubamoto, Shinichi: *See*—
Tanaka, Shinzo; Tsubamoto, Shinichi; Yamashita, Koichi; Eguchi, Tadashi; and Inoue, Kashirou, B 709,088, Cl. 23-232.00R.

Tsuchitani, Akira: *See*—
Okumura, Tomisaburo; Okazaki, Hiroshi; Tsuchitani, Akira; and Ueda, Seiji, B 763,679, Cl. 148-187.000.

Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, to Sumitomo Chemical Company, Limited. Phosphorothiolate pesticidal composition. B 768,875, Cl. 424-225.000.

Tsuji, Sadahiko; and Agari, Yujiro, to Canon Kabushiki Kaisha. Macro zoom lens. B 857,692, Cl. 350-184.000.

Tsukamoto Seiki Co., Ltd.: *See*—
Miida, Eishiro, B 835,012, Cl. 285-334.000.

Tsumori, Toshiro: *See*—
Tokumoto, Shin-Ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, B 801,640, Cl. 204-39.000.
Tokumoto, Shin-ichi; Tanaka, Eiji; Kikuchi, Tatsuo; Ogisu, Kenji; and Tsumori, Toshiro, B 802,487, Cl. 204-39.000.

Tsunekawa, Tokuichi; and Taguchi, Tetsuya, to Canon Kabushiki Kaisha. A leak current suppressing printed circuit board. B 703,962, Cl. 250-214.00R.

Tsuruda, Kunihiro: *See*—
Maki, Masao; Kaneko, Yasunori; Tsuruda, Kunihiro; and Kobayashi, Ikuo, B 846,495, Cl. 423-239.000.

Tsutsui, Nobuyuki; Inui, Tsuneo; and Kawamura, Hiroaki, to Toyo Kohan Co., Ltd. Steel sheet useful in forming foodstuff and beverage cans. B 818,099, Cl. 204-37.00T.

Tsuzuki, Hidehiro: *See*—
Asari, Akira; and Tsuzuki, Hidehiro, 4,112,723, Cl. 72-60.000.

Tucker, Harold A., to B. F. Goodrich Company, The. Ethylenically unsaturated blocked aromatic diisocyanates. B 734,945, Cl. 560-32.000.

Tucker, Hubert J. Method of preventing contamination of beverage containers. 4,112,650, Cl. 53-412.000.

Tugukuni, Hideyoshi; and Kano, Masafumi, to Dai Nippon Toryo Co., Ltd. Powdery coating composition and process for preparing the same. B 683,508, Cl. 428-407.000.

Tuma, Frantisek: *See*—
Chrtek, Milan; Gabler, Josef; Tuma, Frantisek; Kasparek, Karel; and Blasko, Jan, 4,112,663, Cl. 57-58.890.

Turkall, Daniel N.: *See*—
Holman, Robert R.; and Turkall, Daniel N., B 737,761, Cl. 277-1.000.

Turley, Richard J.; and Ozolins, Alexandre, to Olin Corporation. Method of bonding using an improved epoxy composition containing chlorine containing polyols. B 807,456, Cl. 156-330.000.

Turner, Albert W. Lever assemblies for augmenting prime mover power. B 794,971, Cl. 180-65.00D.

Turner, Philip L., to Systems, Science and Software. Method and apparatus for determining the volume of a condensed material sample. 4,112,738, Cl. 73-32.00R.

Turner, Robert B., to Johnson & Johnson. Zero temperature coefficient reference circuit. B 758,629, Cl. 307-310.000.

Turner, Robert B., to Johnson & Johnson. Automatic on/off digitally timed electronic switch. 4,112,764, Cl. 73-362.0AR.

Turner, Robert Bruce; Menzin, Marvin; Robinson, Hugh A.; and Williams, Thomas S., to Johnson & Johnson. Probe cover grip and release device. 4,112,762, Cl. 73-343.00R.

Turtle Wax, Inc.: *See*—
Svedas, Stanley; and Shah, Champak C., B 649,078, Cl. 260-23.00R.

Twilley, Ian Charles: *See—*
Russell, William Norman; Bruton, James Isaac; and Twilley, Ian Charles, B 829,764, Cl. 264-210.00F.
Tylka, Etler-Peter. Spark plug with combustion pressure switches. B 800,950, Cl. 315-51.000.
Uchida, Kuniki; Araki, Kenzi; Narita, Hirosi; Fukunaka, Shiro; and Kurihara, Takao, to Nippon Kokan Kabushiki Kaisha. Process of making high tension cold-reduced Al-killed steel excellent in accelerated aging property. B 776,288, Cl. 148-12.300.
Uchida, Tsuneo: *See—*
Komiyama, Yoshiro; Kondo, Katsumi; Koyama, Mototsugu; Nagaoka, Masaaki; and Uchida, Tsuneo, B 781,408, Cl. 228-176.000.
Uchida, Yoshiro: *See—*
Akado, Hajime; Uchida, Yoshiro; Yamaguchi, Akihide; Nonoyama, Takao; Ootsubo, Suminobu; and Harada, Toshiro, 4,112,896, Cl. 123-122.00D.
Uchidoi, Masanori: *See—*
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Shimizu, Masami; Yoshikawa, Ryoichi; and Aizawa, Hiroshi, B 758,200, Cl. 354-238.000.
Ueda, Seiji: *See—*
Okumura, Tomisaburo; Okazaki, Hiroshi; Tsuchitani, Akira; and Ueda, Seiji, B 763,679, Cl. 148-187.000.
Uehara, Yasuhiro: *See—*
Nishide, Hiroo; and Uehara, Yasuhiro, B 801,678, Cl. 219-216.000.
Uenishi, Akio: *See—*
Seo, Mamoru; and Uenishi, Akio, B 764,177, Cl. 307-311.000.
Ueno, Eijiro, to Ueno Kohgyo Limited. Air-borne transportation system conveying truck. B 785,600, Cl. 243-33.000.
Ueno Kohgyo Limited: *See—*
Ueno, Eijiro, B 785,600, Cl. 243-33.000.
Uerdingen, Walter: *See—*
Bock, Manfred; Pedain, Josef; and Uerdingen, Walter, B 778,631, Cl. 260-859.00R.
Ugelstad, John, to Sintef. Process for preparing latex. B 825,136, Cl. 260-29.6XA.
Uhtenwoldt, Herbert R.; and Humes, Norman S., to Cincinnati Milacron-Heald Corp. Grinding machine. 4,112,624, Cl. 51-5.00D.
Uke, Alan K. Quick adjust strap for diver's face mask. 4,112,521, Cl. 2-452.000.
Uke, Alan Kurt. Diver's flashlight. B 739,290, Cl. 362-158.000.
Uni-Cardan AG: *See—*
Krude, Werner, 4,112,709, Cl. 64-21.000.
Unimax Switch Limited: *See—*
Corfield, John Courtney, B 727,849, Cl. 200-50.00A.
Union Carbide Corporation: *See—*
Atwood, Gilbert Richard, B 781,206, Cl. 423-574.00R.
Kendall, John Edward; and Butwell, Kenneth Francis, B 836,542, Cl. 423-226.000.
Litteral, Carl J., B 724,919, Cl. 423-342.000.
Ward, Robert James, B 773,776, Cl. 260-37.0EP.
Williams, Thomas Charles; and Totten, George Edward, B 810,785, Cl. 260-448.20B.
Union Chimique Continentale-U.C.C.: *See—*
Simon, Pierre, B 695,751, Cl. 260-343.500.
Union Oil Company of California: *See—*
Bernard, George G.; and Holm, LeRoy W., B 774,920, Cl. 166-273.000.
Mickelson, Grant A., B 846,419, Cl. 208-216.000.
United Kingdom Atomic Energy Authority: *See—*
McKnight, James Alan, 4,112,735, Cl. 73-19.000.
Williams, Raymond, B 751,948, Cl. 206-408.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Coates, David; Gray, George William; and McDonnell, Damien Gerard, B 821,146, Cl. 252-299.000.
Pierce, Donald, B 781,866, Cl. 244-219.000.
Shaw, Harry, B 804,237, Cl. 244-20.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
Hayward, Alan Thomas Joseph, 4,112,757, Cl. 73-207.000.
United States Bedding Company, The: *See—*
Golembeck, Gerald A.; and Horwitz, Thomas L., 4,112,529, Cl. 5-354.000.
U.S. Industries, Inc.: *See—*
Van Huis, Robert L., 4,112,872, Cl. 119-22.000.
United States of America
Agriculture: *See—*
Masri, Merle S.; Randall, Virginia G.; and Stanley, William L., B 827,659, Cl. 195-63.000.
Air Force: *See—*
Mazdiyasni, Khodabakhsh S.; and Cooke, Charles M., B 452,038, Cl. 264-101.000.
Army: *See—*
Borowick, John Joseph, B 747,765, Cl. 343-815.000.
Goldsborough, Robert R.; Spencer, David R.; and Wesi, Samuel F., B 176,890, Cl. 343-112.00S.
Nossen, Edward J., B 856,448, Cl. 331-2.000.
Energy: *See—*
Garin, John; and Belsick, James C., B 714,220, Cl. 176-87.000.
Hale, Robert L., 4,112,568, Cl. 29-157.00C.
Jones, Robert D., B 789,154, Cl. 176-40.000.
Health, Education and Welfare: *See—*
Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., 4,112,952, Cl. 128-418.000.
Interior: *See—*
Savanick, George A.; and Krawza, Walter G., B 809,881, Cl. 299-4.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Laumann, Eugene A.; and Reynolds, Rollin K. Hydrogen-fueled engine. 4,112,875, Cl. 123-1.00A.
Navy: *See—*
Benham, Harold L.; Clark, Steven D.; Huffman, Hubert L.; and Stovall, Ronald J., B 806,799, Cl. 320-39.000.
D'Albora, John M., B 446,571, Cl. 340-3.00R.
Davis, Robert H., B 639,031, Cl. 364-718.000.
Funk, Clarence J., B 589,658, Cl. 340-2.000.
Gustafson, Paul R., B 790,623, Cl. 252-184.000.
Hudson, George Elbert, III; and Clark, Arthur E., 4,112,699, Cl. 62-3.000.
Mason, Russell I.; and Dale, John R., B 535,332, Cl. 340-85.000.
Savitt, Jacob, 4,112,845, Cl. 102-27.00R.
U.S. Philips Corporation: *See—*
deBrebisson, Michel, B 764,587, Cl. 148-1.500.
Gansfried, Myles Stephen, B 799,089, Cl. 250-445.00T.
Holland, Johannes; and Wagemans, Hubertus Franciscus Marie, 4,112,768, Cl. 73-422.00R.
Kooi, Else; and vanLierop, Joseph Gijsbertus, B 671,419, Cl. 148-1.500.
Salles, Yvon; Leger, Pierre; and David, Gerard Andre, B 729,345, Cl. 156-345.000.
Van Esdonk, Johannes, 4,112,563, Cl. 29-25.140.
United States Pipe and Foundry Company: *See—*
Kennedy, Harold, Jr., B 856,384, Cl. 285-61.000.
United States Steel Corporation: *See—*
Steiner, John E., B 710,952, Cl. 220-71.000.
United Technologies Corporation: *See—*
Bell, Mace, B 819,744, Cl. 174-52.00R.
Huly, William; and Brouillette, Rudolph G., 4,112,862, Cl. 114-221.00R.
Reeder, Thomas M., B 820,474, Cl. 333-30.00R.
Unitek Corporation: *See—*
Donner, Joseph E., B 602,208, Cl. 219-489.000.
Universite de Sherbrooke: *See—*
Chornet, Esteban; and Cavalier, Jean-Claude, B 811,438, Cl. 252-422.000.
University of California, The Regents of the: *See—*
Gram, Donald J., B 806,054, Cl. 560-38.000.
Schrauzer, Gerhard N.; and Guth, Ted D., B 812,478, Cl. 204-157.10R.
University of Utah: *See—*
Virkar, Anil V.; Miller, Mark L.; Cutler, Ivan B.; and Gordon, Ronald S., B 788,572, Cl. 429-193.000.
Uno, Eiichi; and Hachiga, Takasi, to Nippondenso Co., Ltd. Electromagnetic type contactless ignition apparatus for internal combustion engine. 4,112,904, Cl. 123-148.00E.
UOP Inc.: *See—*
Carlson, David H. J., B 799,825, Cl. 208-206.000.
Michalko, Edward, B 786,527, Cl. 252-455.00Z.
Ward, Dennis J., B 758,092, Cl. 260-669.00R.
Upjohn Company, The: *See—*
DeBoer, Clarence; Dolak, Lester A.; and Peterson, Durey H., B 834,285, Cl. 424-117.000.
Hall, Charles M.; and Wright, John B., B 742,438, Cl. 424-309.000.
Lednicer, Daniel, B 783,806, Cl. 424-248.560.
Moon, Malcolm W.; and Kornis, Gabriel, B 846,158, Cl. 548-374.000.
Moon, Malcolm W.; and Kornis, Gabriel, B 846,159, Cl. 548-374.000.
Nelson, Norman A., B 822,305, Cl. 260-590.00C.
Smith, Herman W., B 820,967, Cl. 560-61.000.
Smith, Herman W., B 820,968, Cl. 560-53.000.
Smith, Herman W., B 820,976, Cl. 560-53.000.
Smith, Herman W., B 820,977, Cl. 560-55.000.
Smith, Herman W., B 820,978, Cl. 560-53.000.
Smith, Herman W., B 821,058, Cl. 560-61.000.
USM Corporation: *See—*
Smith, George William, B 760,264, Cl. 241-24.000.
Utsunomiya, Yutaka: *See—*
Takase, Hirobumi; and Utsunomiya, Yutaka, 4,112,721, Cl. 72-12.000.
Uyeda, Tim M., to Gartner, Klaus W. Padlock. 4,112,715, Cl. 70-38.00A.
Uzuka, Mitsuo, to Sony Corporation. Brushless motor driving circuit. B 810,982, Cl. 318-138.000.
Vadetec Corporation: *See—*
Kemper, Yves Jean; and Bigot, Lucien, 4,112,779, Cl. 74-191.000.
Kemper, Yves Jean; and Bigot, Lucien, 4,112,780, Cl. 74-191.000.
Vaerk, Lembit: *See—*
Fritsch, Robert A.; Gattu, Narahari; and Vaerk, Lembit, 4,112,649, Cl. 52-731.000.
Vagyoczky, Stephen: *See—*
Kooi, J. Peter E.; and Vagyoczky, Stephen, 4,112,584, Cl. 33-292.000.
Vahrenkamp, Oscar Oswald. Pneumatic lift for single axle trailer. B 743,607, Cl. 280-475.000.

Vaill, Ronald E., to Westinghouse Electric Corp. Manual control handle for electric vehicle. B 737,366, Cl. 180-19.00H.

Vajna, Eugenio: *See—*
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, B 775,776, Cl. 260-875.000.

Valley Hydro-Luft, Inc.: *See—*
Brown, Robert M.; and Karliner, Rudolf R., B 723,465, Cl. 222-324.000.

Valmet Oy: *See—*
Kankaanpaa, Matti, B 787,321, Cl. 162-272.000.
Kankaanpaa, Matti, B 787,334, Cl. 162-301.000.
Sailas, Vaino, 4,112,565, Cl. 29-148.40D.

Van der Molen Machinefabriek B.V.: *See—*
Daenen, Bernardus, 4,112,799, Cl. 83-409.000.

Van Dorn Company: *See—*
Dietz, Raymond A. F.; Fundom, Danny L.; Henning, George J.; and McKinney, Lynn B., B 744,965, Cl. 206-508.000.

Van Bavel, Adrianus W. M.: *See—*
Extra, Piet M. J.; Smeets, Lambertus R. J. M.; Van Bavel, Adrianus W. M.; Van Lieshout, Jacobus J.; and Deckers, Albert T., 4,112,870, Cl. 118-657.000.

Van De Kraats, Eduard J.: *See—*
Hoff, Siebe; Ockers, Gerhardus; Buitelaar, Arnold A.; and Van De Kraats, Eduard J., B 779,645, Cl. 44-66.000.

Vandensavel, Jean Marie: *See—*
Smets, Georges Joseph; and Vandensavel, Jean Marie, B 406,350, Cl. 260-308.00D.

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, to C. van der Lely N.V. Soil cultivating implements. B 686,327, Cl. 172-59.000.

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, to C. van der Lely N.V. Soil cultivating implements. B 772,858, Cl. 172-59.000.

van der Lely, Cornelis. Soil cultivating implements. B 672,036, Cl. 172-70.000.

van der Lely, Cornelis. Soil cultivating implements. B 716,768, Cl. 172-59.000.

Vander Meulen, Douglas J., to C. L. Frost & Son, Inc. Wheel bearing assembly with plastic bearing seals. B 826,758, Cl. 308-187.100.

Van Esdonk, Johannes, to U.S. Philips Corporation. Color display tube and method of manufacturing same. 4,112,563, Cl. 29-25.140.

Van Huis, Robert L., to U.S. Industries, Inc. Poultry cage system with poultry removal. 4,112,872, Cl. 119-22.000.

vanLierop, Joseph Gijsbertus: *See—*
Kooi, Else; and vanLierop, Joseph Gijsbertus, B 671,419, Cl. 148-1.500.

Van Lieshout, Jacobus J.: *See—*
Extra, Piet M. J.; Smeets, Lambertus R. J. M.; Van Bavel, Adrianus W. M.; Van Lieshout, Jacobus J.; and Deckers, Albert T., 4,112,870, Cl. 118-657.000.

van Oorschot, Gosewinus Franciscus: *See—*
Goransson, Lars Roland; van Oorschot, Gosewinus Franciscus; and Pittoors, Jan Gustaaf, B 750,835, Cl. 55-97.000.

Van Ordstrand, Cayrl W.: *See—*
Gilbert, Henry L.; and Van Ordstrand, Cayrl W., 4,112,846, Cl. 102-52.000.

Van Ornum, Joel V.; and Stang, Peter L., to Rocket Research Corp. Elastomeric sealant composition. B 595,351, Cl. 260-876.00B.

Van Rens, Russell J.: *See—*
Hackbarth, Eugene R.; and Van Rens, Russell J., B 780,590, Cl. 261-52.000.

Van Zandt, Robert D. Animal climbing structure kit. 4,112,873, Cl. 119-29.000.

Vapor Corporation: *See—*
Troy, M. Frank, B 748,058, Cl. 185-40.00R.

Varian Mat GmbH: *See—*
Lerche, Heinz, B 755,881, Cl. 307-229.000.

Varma, Ravi K.; and Cimarusti, Christopher M., to E. R. Squibb & Sons, Inc. Steroidal[16α,17-b]benzodioxins. B 850,514, Cl. 260-239.55R.

Vasilenko, Valentin Vasilievich: *See—*
Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich, B 679,437, Cl. 169-12.000.

Vasiliev, Vladimir Sergeevich; Annenberg, Ernest Alexandrovich; Livshits, Abram Lazarevich; Polotsky, Vadim Evgenievich; and Lakhtjukhov, Valery Mikhailovich. Electric discharge machine with a program copier and a tool support head carried by a longitudinally and transversely driven carriage. B 780,357, Cl. 219-69.00W.

Veba-Chemie Aktiengesellschaft: *See—*
Kurandt, Hans-Friedrich; and Schliephake, Dietrich, B 740,469, Cl. 423-170.000.

Vecsey, Louis R.: *See—*
Wattles, Gurdon B.; and Vecsey, Louis R., B 778,363, Cl. 241-188.00A.

Velsicol Chemical Company: *See—*
Stach, Leonard J.; Hotz, Roger D.; and Richter, Sidney B., B 784,212, Cl. 71-88.000.

Venable, Phillip G., to J. I. Case Company. Power shift mechanism for earth working implements. B 818,702, Cl. 172-667.000.

Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Biricz, Stefan, B 749,119, Cl. 164-446.000.

Verhaeghe, Michael: *See—*
Balinte, Joe; and Verhaeghe, Michael, B 734,091, Cl. 171-61.000.

Verini, Anthony J. Dual pivot mount assembly for an automobile antenna. B 737,552, Cl. 343-715.000.

Verini, Anthony J. Automobile antenna mounting bracket apparatus. B 762,442, Cl. 343-715.000.

Verini, Anthony J. Mount assembly for antennas with male-female securing means. B 805,889, Cl. 343-715.000.

Vermillion, Henry J., Jr.: *See—*
Helton, Eugene L.; Gale, Preston L.; Moen, Lowell J.; Mueller, Robert C.; Pierce, Walker L., Jr.; and Vermillion, Henry J., Jr., B 733,562, Cl. 428-565.000.

Versapak International Limited: *See—*
Anderson, Michael Denny, 4,112,990, Cl. 150-3.000.

Veyo, Stephen E.: *See—*
Sisk, Francis J.; and Veyo, Stephen E., 4,112,705, Cl. 62-238.000.

Vickers-Intertek Limited: *See—*
Ball, Kenneth, B 771,356, Cl. 277-9.000.

Victor Company of Japan, Limited: *See—*
Kayanuma, Kanji, B 832,890, Cl. 358-128.000.

Victor Stanley, Inc.: *See—*
Skalka, Gerald P., B 873,976, Cl. 297-454.000.

Vierkant, Mark A.: *See—*
Anderson, Leroy E.; Charlson, David V.; and Vierkant, Mark A., 4,112,731, Cl. 72-320.000.

Virkar, Anil V.; Miller, Mark L.; Cutler, Ivan B.; and Gordon, Ronald S., to University of Utah. Method of preparing dense, high strength, and electrically conductive ceramics containing β''-alumina. B 788,572, Cl. 429-193.000.

Visconti, Matteo, to Soxil S.p.A. Evaporating mixer for volatile anaesthetics. 4,112,939, Cl. 128-186.000.

Vishnevsky, Leonid Denisovich: *See—*
Sobolev, Georgy Georgievich; Kozljuk, Anatoly Ivanovich; Kolyshenko, Mikhail Vasilievich; Makarenko, Valery Leonidovich; Vasilenko, Valentin Vasilievich; Vishnevsky, Leonid Denisovich; and Kukhno, Viktor Ivanovich, B 679,437, Cl. 169-12.000.

Vita, Anthony J.: *See—*
Thomas, George M.; Boretos, John W.; Syracuse, Donald C.; Clark, John A.; Vita, Anthony J.; and Gaudiani, Vincent A., 4,112,952, Cl. 128-418.000.

Vivitar Corporation: *See—*
Altman, Richard M., B 674,229, Cl. 354-152.000.

Vockenhuber, Karl: *See—*
Freudenschuss, Otto, B 749,333, Cl. 356-5.000.

Vogel, Gerald James: *See—*
Kramer, Franklin; Henig, Yair Steve; Garin, Torunn Atteraas; and Vogel, Gerald James, B 771,485, Cl. 426-422.000.

Vogt, Wilhelm: *See—*
aus der Funten, Helmut; and Vogt, Wilhelm, B 783,576, Cl. 260-343.30R.

Volk, Heinrich: *See—*
Papenfuhs, Theodor; and Volk, Heinrich, B 799,001, Cl. 260-439.00R.

Volkswagenwerk Aktiengesellschaft: *See—*
Beier, Alfred, 4,112,783, Cl. 74-470.000.
Heitland, Herbert; and Renger, Udo, 4,112,878, Cl. 123-32.0ST.
Muller, Hans; and Hanke, Georg, B 746,101, Cl. 188-282.000.

Vollkommer, Norbert: *See—*
Blumenfeld, Georg; and Vollkommer, Norbert, B 640,312, Cl. 528-299.000.

Volpe, Giancarlo: *See—*
Cavalleri, Bruno; and Volpe, Giancarlo, B 759,697, Cl. 548-339.000.

Von Allmen, Martin; and Schwob, Hans Peter, to Lasag AG. Method for ablating metal workpieces with laser radiation. B 728,403, Cl. 219-121.0LM.

von Bergmann, Hubertus Michael: *See—*
Hasson, Victor Haim; and von Bergmann, Hubertus Michael, B 692,085, Cl. 331-94.50G.

von Linde, Joachim: *See—*
von Linde, Robert; von Linde, Joachim; and Kurz, German, B 690,617, Cl. 431-352.000.

von Linde, Robert; von Linde, Joachim; and Kurz, German, to Caloric Gesellschaft Fuer Apparatebau m.b.H. Burner for fluid fuels. B 690,617, Cl. 431-352.000.

von Loeben, Wolf: *See—*
Kiefer, Udo; von Loeben, Wolf; and Schulz, Friedrich Wilhelm, B 783,407, Cl. 356-155.000.

von Wimmersperg, Heinrich F. Convertible child restraint. B 786,078, Cl. 297-216.000.

Vredenburgh, Walter A.: *See—*
Douglas, Paul S.; Patellis, Anargiros Pete; and Vredenburgh, Walter A., B 636,340, Cl. 260-876.00B.

Vyzkumny ustav bavlnarsky: *See—*
Chrtek, Milan; Gabler, Josef; Tuma, Frantisek; Kasparek, Karel; and Blasko, Jan, 4,112,663, Cl. 57-58.890.

W. R. Grace & Co.: *See—*
Berry, Lawrence James; and Hall, Stanley Darwin, B 796,279, Cl. 221-1.000.

W. Schlafhorst & Co.: *See—*
Raasch, Hans; and Muller, Lothar, B 633,707, Cl. 242-18.00R.

W. Vinten Limited: *See—*
Stapleton, Harold Reginald, B 757,933, Cl. 248-183.000.

WABCO Westinghouse GmbH: *See—*
Ruhnau, Gerhard; Gudat, Wolfgang; Liermann, Peter; and Hesse, Karl-Heinz, B 809,886, Cl. 303-105.000.

Wacker-Chemie GmbH: *See—*
Frey, Volker; Riedle, Rudolf; John, Peter; Kalchgruber, Gerhard; Spork, Helmut; and Leser, Robert, B 808,767, Cl. 260-448.20E.

Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See*—
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, B 737,249, Cl. 148-174.000.

Wada, Hajime: *See*—
Deguchi, Hidetaka; Kikuchi, Shoji; Wada, Hajime; Satoh, Shui; and Endo, Takaya, B 656,084, Cl. 96-66.00R.

Wada, Masao: *See*—
Himizu, Junichi; Harigaya, Shoichi; Saijo, Shigeyoshi; Wada, Masao; Noguchi, Katsuyuki; and Takaiti, Osasi, B 793,920, Cl. 424-274.000.

Waddill, Harold G.: *See*—
Schulze, Heinz; and Waddill, Harold G., B 743,818, Cl. 528-94.000.

Wade, Elman E., to Westinghouse Electric Corp. Nuclear fuel handling grapple carriage with self-lubricating bearing. B 748,352, Cl. 176-30.000.

Wagemans, Hubertus Franciscus Marie: *See*—
Holland, Johannes; and Wagemans, Hubertus Franciscus Marie, 4,112,768, Cl. 73-422.00R.

Waghorne, Winfield Earle: *See*—
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, B 686,496, Cl. 423-512.00A.

Wagner, Hans: *See*—
Klenk, Herbert; Lussling, Theodor; Maierhofer, Alfred; Offermanns, Heribert; and Wagner, Hans, B 802,946, Cl. 260-545.00R.

Wagner, Romeo Barrick, to Hercules Incorporated. Promotion of plant growth with compositions containing a dithiocarbamic acid derivative. B 789,303, Cl. 71-7.000.

Wagner, Wayne M.; and Campbell, John A., to Donaldson Company, Inc. Exhaust system and muffler lap joint. B 773,847, Cl. 285-322.000.

Wald Manufacturing Company, Inc.: *See*—
Pawsat, Carlton P.; and Humlong, Robert F., B 782,662, Cl. 403-22.000.

Waldmann, Helmut: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, B 678,822, Cl. 260-348.250.

Walker, Frank H., to General Motors Corporation. Centrifugal lock-up clutch and torque converter. B 798,768, Cl. 192-3.310.

Walker, Harold G. Two-way scraper for ground tillage discs. B 758,655, Cl. 172-566.000.

Wall, Robert G., to Chevron Research Company. Catalyst for ester hydrogenation. B 790,366, Cl. 252-473.000.

Wallbergs Fabriks AB: *See*—
Svensson, Einar Gustav-Vilhelm, 4,112,570, Cl. 29-241.000.

Walley, Richard J. Automatic portable solid state voltage regulator tester. 4,112,748, Cl. 73-118.000.

Walski, Stanley, to Con-Spec Devices Inc. Apparatus to adjust and maintain the distance between wall forms. B 782,877, Cl. 249-216.000.

Walter, Gerald Joseph: *See*—
Hager, Robert Bonner; Toukan, Sameeh Said; and Walter, Gerald Joseph, B 459,132, Cl. 260-348.430.

Walter, Henry J., to Clairol, Inc. Ultrasonic cleaner. B 824,239, Cl. 366-111.000.

Walter, Karl, to Agfa-Gevaert AG. Feeding and electrostatic holding originals in a copying machine. B 828,971, Cl. 355-75.000.

Wambach, Allen Dale, to General Electric Company. Reinforced thermoplastic compositions of polyester resins and a polycarbonate resin. B 747,635, Cl. 260-40.00R.

Wang, Long Shyong: *See*—
Ruckel, Erwin Richard; and Wang, Long Shyong, B 814,527, Cl. 252-429.00B.

Wanner, Karl; and Reibetanz, Wilbert, to Robert Bosch GmbH. Rock drill. B 749,034, Cl. 175-207.000.

Ward, Barry S.: *See*—
Helixon, Michael L.; and Ward, Barry S., 4,112,945, Cl. 128-218.00D.

Ward, Dennis J., to UOP Inc. Aromatic hydrocarbon dehydrogenation process. B 758,092, Cl. 260-669.00R.

Ward, Robert James, to Union Carbide Corporation. Polymeric organosilicon compounds. B 773,776, Cl. 260-37.0EP.

Wardwell, Charles H.; and Holcomb, Norman L., to Research Engineering & Manufacturing, Inc. Heat-treated article. 4,112,812, Cl. 85-46.000.

Wareham, Richard R.: *See*—
Driscoll, John J.; and Wareham, Richard R., B 749,511, Cl. 354-76.000.

Warman International Limited: *See*—
Grzina, Anthony, B 691,436, Cl. 415-170.00R.

Warner, Dale A.: *See*—
Schuman, Paul D.; Tarrant, Paul; Warner, Dale A.; and Westmoreland, Geraldine, B 665,865, Cl. 544-303.000.

Wasai, Hiromi: *See*—
Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, B 626,098, Cl. 325-320.000.

Washington State University Research Foundation: *See*—
Talbott, John W.; and Logan, James D., B 747,391, Cl. 264-24.000.

Wasness, Donald S.: *See*—
Thrower, Herbert T., Jr.; and Wasness, Donald S., B 733,321, Cl. 315-226.000.

Watanabe, Haruo; and Negishi, Masaaki, to Showa Sangyo Kabushiki Kaisha. Method for refining of palm oils. B 697,192, Cl. 260-424.000.

Watanabe, Haruo: *See*—
Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, B 771,665, Cl. 431-1.000.

Watanabe, Kazuo; Endo, Toshio; and Kojima, Katsuhiro, to Daido Tokushuko Kabushiki Kaisha. Automatic deseaming apparatus for elongate block of metallic material. 4,112,626, Cl. 51-35.000.

Watanabe, Kazuo: *See*—
Kakinuma, Toshihide; Kume, Toshiaki; Takenoya, Hideaki; Makabe, Hachiro; and Watanabe, Kazuo, 4,112,858, Cl. 112-158.00E.

Watanabe, Masanori: *See*—
Onda, Eiichi; Watanabe, Masanori; Nakagawa, Tadashi; Nemoto, Ichiro; and Koyama, Mitsuo, B 766,745, Cl. 354-249.000.

Watanabe, Morio; and Nishimura, Sanji, to Solex Research Corporation of Japan. Process for recovery of waste H_2SO_4 and HCl. B 773,657, Cl. 204-151.000.

Watson, Albert T.; and Hull, Robert L., to Exxon Research & Engineering Co. Polypropylene impact blends having improved optical properties. B 718,846, Cl. 260-897.00A.

Watt, William R.; Astolfi, Edmund G.; and Laufer, Jay K., to American Can Company. Method for producing multilayered coated substrate. B 743,133, Cl. 427-44.000.

Wattles, Gurdon B.; and Vecsey, Louis R., to Entoleter, Inc. Laminated rotor processing apparatus. B 778,363, Cl. 241-188.00A.

Wavin B.V.: *See*—
de Putter, Warner Jan, 4,112,795, Cl. 83-15.000.

Wear-Cote International, Inc.: *See*—
Henry, Russell Alger; and Summers, Ernest Moreland, B 799,772, Cl. 427-290.000.

Webasto-Werk W. Baier GmbH & Co.: *See*—
Leiter, Robert, B 863,709, Cl. 296-137.00G.

Webb, Allen N.: *See*—
Herbstman, Sheldon; Webb, Allen N.; and Estes, John H., B 746,766, Cl. 252-442.000.

Webb, Michael Guthrie, to British Petroleum Company Limited, The. Oil boom. 4,112,689, Cl. 405-63.000.

Webb, Robert: *See*—
Show, Roger; and Webb, Robert, B 764,551, Cl. 423-155.000.

Weber, Helmut: *See*—
Jutte, Hans; and Weber, Helmut, 4,112,696, Cl. 405-145.000.

Wedemeyer, Karlfried: *See*—
Fiege, Helmut; Haydn, Josef; Renner, Johann; and Wedemeyer, Karlfried, B 757,422, Cl. 568-756.000.

Weed Eater, Inc.: *See*—
Ballas, George C.; and Mitchell, Albert W., 4,112,653, Cl. 56-12.700.

Wehinger, Egbert: *See*—
Moller, Eike; Meng, Karl-August, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, B 693,971, Cl. 548-377.000.
Moller, Eike; Meng, Karl, deceased; Wehinger, Egbert; Horstmann, Harald; and Seuter, Friedel, B 766,235, Cl. 424-273.00P.

Wehner, Norvin J., deceased (by Wehner, Virginia L., surviving spouse), to Cramer Industries, Inc. Locking device. B 801,055, Cl. 248-408.000.

Wehner, Virginia L., surviving spouse: *See*—
Wehner, Norvin J., deceased, B 801,055, Cl. 248-408.000.

Weiberg, Otto: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, B 678,822, Cl. 260-348.250.

Weigert, Wilhelm: *See*—
Olbrich, Gottfried; and Weigert, Wilhelm, 4,112,978, Cl. 138-30.000.

Weird Products Ltd.: *See*—
Huston, Henry H., B 774,372, Cl. 273-96.00R.

Weiss, Martin Joseph, to American Cyanamid Company. 15,16-Dioxy prostenoic acids and esters. B 767,863, Cl. 560-121.000.

Weiss, Warren I.: *See*—
Rosenthal, Isadore; Exner, Lawrence J.; Niksa, Gregory J.; Weiss, Warren I.; and Young, Maurice G., 4,112,714, Cl. 68-206.000.

Weitzel, Hans: *See*—
Bischoff, Jurgen; Kowitz, Friedrich; Ott, Karl-Heinz; Schuster, Herbert; Rohr, Harry; and Weitzel, Hans, B 400,980, Cl. 260-876.00R.

Weitzner, Jonas. Slide fastener bottom ends. 4,112,553, Cl. 24-205.11R.

Wellman, James H. Gas pump nozzle. B 792,463, Cl. 222-571.000.

Wells, John B., to Xerox Corporation. Migration imaging method involving color change. B 735,344, Cl. 96-1.0PS.

Wells, Tom J.: *See*—
Adams, Elvin E.; Wells, Tom J.; Wentzek, Horst F.; Zapletal, Henry; and Zugel, Marty J., 4,112,726, Cl. 72-137.000.

Wenrick, Brian A., to Protective Treatments, Inc. Longitudinally curved impact resistant trim strips. B 753,449, Cl. 293-71.00R.

Wentzek, Horst F.: *See*—
Adams, Elvin E.; Wells, Tom J.; Wentzek, Horst F.; Zapletal, Henry; and Zugel, Marty J., 4,112,726, Cl. 72-137.000.

Werba, William J.: *See*—
MacLennan, P. H. Barry; Ireland, Graham A.; and Werba, William J., 4,112,756, Cl. 73-181.000.

Werder, Roger Daniel; Meier, Linus; and Lang, Karl, to Mettler Instrumente AG. Automatic analysis apparatus. B 551,517, Cl. 422-65.000.

Werlich, Harald Willy: *See*—
Pole, Robert Vladimir; and Werlich, Harald Willy, B 798,042, Cl. 350-3.710.

Werner, Clements M. Fire extinguishant dispensing nozzles. B 769,425, Cl. 169-37.000.

Werner, Dietmar: *See*—
Gettert, Hans; Jeck, Arnulf; and Werner, Dietmar, B 861,744, Cl. 48-197.00R.

Werner, Paul; Wirtz, Egon; and Lehmann, Gerhard, to Keiper K. G. Tiltable seat. B 786,815, Cl. 297-362.000.

Werst, Lyman L., to Parks-Cramer Company. Plural sensor ends down detecting apparatus. 4,112,665, Cl. 57-81.000.

Wessling, Ritchie A.: *See*—
Pickelman, Dale M., Sr.; and Wessling, Ritchie A., B 776,167, Cl. 526-30.000.

West, Samuel F.: *See*—
Goldsborough, Robert R.; Spencer, David R.; and West, Samuel F., B 176,890, Cl. 343-112.00S.

Western Electric Company: *See*—
Clement, George Frederick; and Sniegowski, Bruno Raymond, B 844,377, Cl. 179-2.00A.

Western Electric Co., Inc.: *See*—
Tedeschi, Anthony, B 793,325, Cl. 200-234.000.

Westfalia Separator Aktiengesellschaft: *See*—
Pautsch, Gunthard; and Kohlstette, Werner, B 811,421, Cl. 233-11.000.

Westinghouse Air Brake Company: *See*—
Balukin, Richard F., B 835,123, Cl. 303-54.000.
Zoric, Michael T., B 749,288, Cl. 303-37.000.

Westinghouse Brake & Signal Co. Ltd.: *See*—
Paginton, Philip Norman, B 816,133, Cl. 188-196.00F.

Westinghouse Electric Corp.: *See*—
Albaric, Jacques E., B 720,331, Cl. 310-54.000.
Albaric, Jacques E.; Curtis, Little P.; and Dailey, George F., B 720,332, Cl. 310-54.000.
Asars, Juris A., B 780,138, Cl. 315-169.0TV.
Cameron, Frank L., B 622,279, Cl. 337-162.000.
Csanady, Michael, Jr., B 749,555, Cl. 210-167.000.
Csanady, Michael, Jr., 4,112,975, Cl. 137-625.290.
DeCorso, Serafino M., 4,112,676, Cl. 60-39.710.
Eley, Edgar R., B 828,467, Cl. 339-111.000.
Fidler, Gary L.; Hill, Richard A.; and Carrera, John P., B 686,858, Cl. 176-38.000.
Frink, Russell E.; and Milianowicz, Stanislaw A., B 468,332, Cl. 200-144.00R.
Glaudel, Stephen P.; and Chambers, Norman T., B 735,718, Cl. 322-38.000.
Gohm, William G., B 742,474, Cl. 209-215.000.
Hull, Robert E.; and Gemp, Robert S., B 816,556, Cl. 307-53.000.
Lee, Richard M.; and Szema, Li C., B 742,739, Cl. 415-115.000.
Maier, Alfred E.; Armstrong, Donald D.; and Farley, James R., B 829,702, Cl. 200-153.00G.
McCabe, Barkman C.; and Zajac, Edward, 4,112,745, Cl. 60-641.000.
Nelkin, Arthur; Skinner, Dale D.; Wilson, Donald G.; and Palmer, Harold D., B 791,434, Cl. 310-334.000.
Oates, Robert M.; and Mackenzie, Raymond W., B 783,525, Cl. 318-473.000.
Petrie, Edward M., B 749,592, Cl. 260-29.2EP.
Pillsbury, Paul W.; and DeCorso, Serafino M., 4,112,675, Cl. 60-39.060.
Smith, James D. B.; and Kauffman, Robert N., B 773,875, Cl. 260-830.0TW.
Tobin, Joseph M., B 646,812, Cl. 176-84.000.
Vaill, Ronald E., B 737,366, Cl. 180-19.00H.
Wade, Elman E., B 748,352, Cl. 176-30.000.

Westmoreland, Geraldine: *See*—
Schuman, Paul D.; Tarrant, Paul; Warner, Dale A.; and Westmoreland, Geraldine, B 665,865, Cl. 544-303.000.

Weston, David, to Reynolds Metals Company. Concentration of hydrated aluminum oxide minerals by flotation. B 736,466, Cl. 75-2.000.

Westvaco Corporation: *See*—
Forbes, Hampton E., Jr., B 842,261, Cl. 206-45.140.

Westwood, William Dickson, to Northern Telecom Limited. Multiple lens system for an optical imaging device. B 797,509, Cl. 250-216.000.

Wetzels, Walter, to SCHUMAG Schumacher Metallwerke Gesellschaft mit beschankter Haftung. Device for grinding elongated cylindrical workpieces. 4,112,625, Cl. 51-33.00W.

Wheeler, David C. Lighter-than-air apparatus and method of utilizing same. B 797,290, Cl. 244-31.000.

Wheldon, Alfred G.; and Harris, Ernest D., to Distillers Company (Carbon Dioxide) Ltd., The. Gas detector. 4,112,736, Cl. 73-23.000.

Whirlpool Corporation: *See*—
Marcade, Roque Denis, 4,112,588, Cl. 34-45.000.

White Chemical Corporation: *See*—
Mischutin, Vladimir, B 751,661, Cl. 427-390.00D.

White, James E.: *See*—
Schumacher, Ignatius; and White, James E., B 734,893, Cl. 203-8.000.

White, James F.; and Applequist, Michael D., to Standard Oil Company, The. Preparation of acrylic or methacrylic acid from acrolein or methacrolein. B 748,081, Cl. 562-535.000.

Whitehead, James Stephen: *See*—
Liberman, Harvey W.; and Whitehead, James Stephen, 4,112,823, Cl. 91-36.000.

Whiting Corporation: *See*—
Bella, Frank, Jr.; and Bennett, Richard C., B 712,033, Cl. 159-27.00A.

Widdicombe, Derek Gordon, to Naylor Brothers (Clayware) Limited. End cap for pipes. 4,112,979, Cl. 138-89.000.

Wiedemann, Kurt; and Seiferth, Reinhard, to Siemens Aktiengesellschaft. Pulse radar apparatus with integration device. B 056,013, Cl. 343-7.700.

Wiedenmann, Hans, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen m.b.H. Subminiature incandescent lamp. B 805,368, Cl. 313-315.000.

Wiegand, Karl E.: *See*—
Lawrence, Walter W., Jr.; McKay, Tom W.; and Wiegand, Karl E., B 807,738, Cl. 562-568.000.

Wiener, Hans, to C. A. Weidmuller KG. Cable-stripping tool. 4,112,791, Cl. 81-9.50A.

Wild, John Paul, to Commonwealth Scientific and Industrial Research Organization. Geodesic lens. B 753,383, Cl. 343-754.000.

Wild, Robert W.; and Keeney, Joseph G., to C. H. Heist Corporation. High pressure jet wall cleaner apparatus. 4,112,535, Cl. 15-98.000.

Wilkinson Sword Limited: *See*—
Thompson, John; and Pitfield, Adrian, B 662,266, Cl. 252-90.000.

Willbanks, Charles E., to Milliken Research Corporation. Method for sculpturing pile fabrics. 4,112,560, Cl. 28-160.000.

Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Auxiliary sewing machine support table for use with a sewing machine table. 4,112,859, Cl. 112-217.100.

Williams, Douglas W.; and Kaiser, George E., to Allis-Chalmers Corporation. Articulated steering differential lock release. B 750,918, Cl. 180-51.000.

Williams, Gayland M. Tube clamp and piercing device. 4,112,944, Cl. 128-214.00R.

Williams, Geoffrey N. Sanitary disposal unit. 4,112,523, Cl. 4-111.300.

Williams, Raymond, to United Kingdom Atomic Energy Authority. Packaging. B 751,948, Cl. 206-408.000.

Williams, Thomas Charles; and Totten, George Edward, to Union Carbide Corporation. Polysulfide silicon compounds. B 810,785, Cl. 260-448.20B.

Williams, Thomas S.: *See*—
Turner, Robert Bruce; Menzin, Marvin; Robinson, Hugh A.; and Williams, Thomas S., 4,112,762, Cl. 73-343.00R.

Williamson, Jim R.: *See*—
Barrington, Burchus Q.; and Williamson, Jim R., B 811,506, Cl. 166-334.000.

Williamson, Robert R., to Better Agricultural Goals Corporation. Disposable container for bulk materials. B 460,053, Cl. 222-105.000.

Willis, Donald Henry, to RCA Corporation. High voltage protection circuit having predictable firing point. B 819,187, Cl. 315-411.000.

Wilson, Clyde E., to Wilson-Tek Corporation. Method of preparing and belling thermoplastic pipe with thickened walls. B 790,303, Cl. 264-25.000.

Wilson, Donald G.: *See*—
Nelkin, Arthur; Skinner, Dale D.; Wilson, Donald G.; and Palmer, Harold D., B 791,434, Cl. 310-334.000.

Wilson, Eugene M.: *See*—
Richardson, Warner G.; and Wilson, Eugene M., B 826,576, Cl. 280-154.50R.

Wilson-Tek Corporation: *See*—
Wilson, Clyde E., B 790,303, Cl. 264-25.000.

Wimer, Scotty: *See*—
Putman, Edgar N.; Patterson, George; Wimer, Scotty; and McCool, John B., 3rd, B 601,628, Cl. 252-363.500.

Wind, Walter Jamison, to Cohu, Inc. Camera housing optical sealing method and device. B 835,242, Cl. 220-319.000.

Wing, George S., to Hi-Shear Corporation. Safety bolt. 4,112,992, Cl. 151-29.000.

Wing, Milton S.: *See*—
Strojny, Edwin J.; Friedli, Hans R.; and Wing, Milton S., B 828,409, Cl. 260-346.750.

Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., to Firmenich & Cie. Flavoring agents. B 825,111, Cl. 426-536.000.

Winters, Giorgio; and DiMola, Nunzio, to Gruppo Lepetit S.p.A. Fused isoquinoline derivatives. B 713,011, Cl. 260-288.0CF.

Winters, Paul N. Constant phase delay network having a coherent reference. B 799,445, Cl. 331-23.000.

Wippich, Joachim, to Research Machine & Development, Inc. Padlock device. 4,112,716, Cl. 70-38.00C.

Wirthwein, Rolf: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rolf; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, B 678,822, Cl. 260-348.250.

Wirtz, Egon: *See*—
Werner, Paul; Wirtz, Egon; and Lehmann, Gerhard, B 786,815, Cl. 297-362.000.

Wirtz, John Stanley, to Itek Corporation. Linear exposure control system. B 773,568, Cl. 355-55.000.

Wissel, Richard B.: *See*—
Hagner, Clifford K.; and Wissel, Richard B., B 781,385, Cl. 252-8.600.

Withem, Ronald. Weatherproof insulated valve cover. 4,112,967, Cl. 137-375.000.

Witte, Johan Frederik, to Stork Amsterdam B.V. Apparatus for treating oil containing vegetable raw materials. 4,112,836, Cl. 99-483.000.

Wittenberg, Roland C., to Pickering & Company, Inc. Double stylus

assembly for phonograph record stamper playback. B 790,397, Cl. 274-37.000.

Witteveen, Piet Jozef: *See*—
Kocher, Heinz; Kitzig, Werner; and Witteveen, Piet Jozef, B 566,178, Cl. 244-3.110.

Woffenden, John: *See*—
Coons, Robert R.; Hennessey, Richard G.; and Woffenden, John, B 811,499, Cl. 188-71.600.

Wolf, Tobin. Game with toy having rotating and straight-line movement. B 767,970, Cl. 273-108.000.

Wolfarth, Robert P.: *See*—
Graef, Harry T.; Richardson, Jack M.; and Wolfarth, Robert P., B 761,288, Cl. 221-6.000.

Wolfe, Denis G.: *See*—
Parsons, Bruce B.; and Wolfe, Denis G., B 758,036, Cl. 337-387.000.

Wolfrum, Gerhard: *See*—
Hugl, Herbert; Schundehutte, Karl Heinz; Trautner, Kersten; and Wolfrum, Gerhard, B 813,311, Cl. 8-41.00R.

Wood, Charles D., III: *See*—
Melton, Rosser B., Jr.; Colburn, John W., Jr.; and Wood, Charles D., III, B 515,310, Cl. 299-13.000.

Wood, Hamish Christopher Swan; and Paterson, Thomas, to Burroughs Wellcome Co. Certain pyrido-pyrimidines for treating mammalian and avian infections. B 335,102, Cl. 424-180.000.

Wood, William G.: *See*—
Shoemaker, Robert H.; and Wood, William G., B 759,763, Cl. 134-10.000.

Woodbury, Dean F. Compartmented receptacle. B 664,585, Cl. 224-26.00E.

Woods, William W. Convertible aerial projectile toy. 4,112,612, Cl. 46-74.00D.

Workman, John. Mould clamping and positioning system. B 744,095, Cl. 164-255.000.

Worthington, Paul Anthony: *See*—
Shephard, Margaret Claire; Sugavanam, Balsubramanyan; Worthington, Paul Anthony; Collins, David John; and Griffin, David, B 750,017, Cl. 71-92.000.

Worthington Pump, Inc.: *See*—
Bush, Austin R.; and Ferrarese, Frank L., B 773,778, Cl. 206-319.000.

Wride, Donald Charles. Hydraulic jacks. B 841,723, Cl. 254-108.000.

Wright, Glenn Lamont; and Ellis, James Arthur, to Youngstown Steel Door Company, The. Elevating and shifting railway car sliding door mechanism. 4,112,540, Cl. 16-99.000.

Wright, James Irvin: *See*—
Grode, Gerald Arthur; Boggs, Daniel Roy; and Wright, James Irvin, 4,112,989, Cl. 150-1.000.

Wright, John B.: *See*—
Hall, Charles M.; and Wright, John B., B 742,438, Cl. 424-309.000.

Wright, John T., to Champion International Corporation. Press brake control circuit. B 753,647, Cl. 192-129.00B.

Wright Line Inc.: *See*—
O'Toole, Jerome M.; and Paquette, Edmund T., B 832,729, Cl. 312-184.000.

Wrue, Richard J.: *See*—
Clark, James A.; Livesey, Donald V.; and Wrue, Richard J., B 762,221, Cl. 249-105.000.

Wucik, Joseph A., Jr.: *See*—
Simmons, Kenneth C.; Champlin, Harry C., Jr.; Livorsi, Carl F.; and Wucik, Joseph A., Jr., B 797,921, Cl. 277-168.000.

Wulfers, Thomas F., to Shell Oil Company. Triazine-urea grease thickeners. B 852,395, Cl. 252-51.50A.

Wurm, Jaroslav: *See*—
Rush, William F.; Wurm, Jaroslav; and Dufour, Raymond J., B 738,481, Cl. 165-3.000.

Wurtz, Frank R.; and Hawkins, Thomas J., to Wurtz, Frank R. Wind generator system. B 772,270, Cl. 416-17.000.

Wust, Manfred: *See*—
Roman, Alain; Sachetto, Jean-Pierre; Wust, Manfred; and Koutroulos, Jean, B 768,494, Cl. 96-1.0PC.

Wycoff, Keith H.; and Dittmer, William H., to Wycoff, Keith H. Decoder operable only on reception of predetermined number of words. B 598,587, Cl. 340-164.00R.

Xerox Corporation: *See*—
Deshpande, Narayan V., 4,112,841, Cl. 101-141.000.
Durbin, John Alan, B 782,865, Cl. 353-122.000.
Fraser, Lawrence J.; and Liebman, Alan, B 758,538, Cl. 355-4.000.
Gorham, Michael L.; Heckman, Raymond F.; and Yole, Charles S., B 793,453, Cl. 179-90.00B.
Gorham, Michael L.; and Norian, Roger F., B 793,454, Cl. 179-90.00B.
Heckman, Raymond F.; and Torpie, John D., B 793,455, Cl. 179-90.00B.
Rodda, John C., B 800,581, Cl. 355-15.000.
Wells, John B., B 735,344, Cl. 96-1.0PS.

Yagi, Hiroshi: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.

Yajima, Toshio: *See*—
Fuse, Takeshi; Yajima, Toshio; Hino, Isao; and Oka, Shohei, B 761,278, Cl. 248-204.000.

Yakhilevich, Fritiof Meerovich: *See*—
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, B 702,208, Cl. 423-131.000.

Yale, Ramon L.: *See*—
Ferri, John L.; Mathers, James E.; and Yale, Ramon L., B 525,589, Cl. 252-301.40S.

Yamada, Minoru; Shishido, Tadao; and Arai, Atsuaki, to Fuji Photo Film Co., Ltd. Method for improving the light fastness of color photographic dye images. B 686,201, Cl. 96-56.000.

Yamada, Tateo: *See*—
Suzaki, Kuniyoshi; Ashida, Akira; Itani, Takashi; Yamada, Tateo; Maeda, Masaya; Takahashi, Kiyoshi; and Takimoto, Hiroyuki, B 736,223, Cl. 352-194.000.

Yamaguchi, Akihide: *See*—
Akado, Hajime; Uchida, Yoshiro; Yamaguchi, Akihide; Nonoyama, Takao; Ootsubo, Suminobu; and Harada, Toshiro, 4,112,896, Cl. 123-122.00D.

Yamaguchi, Hisashi; Sato, Seii; Iemori, Toshiaki; and Andoh, Shizuo, to Fujitsu Limited. Method and apparatus for driving a gas-discharge display panel. B 767,690, Cl. 315-169.0TV.

Yamaguchi, Yasuo, to Sumitomo Electric Industries, Ltd. Method and apparatus for continuously hot-stretching a steel cable. 4,112,725, Cl. 72-128.000.

Yamamori, Eiji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera with data-recording structure. B 718,414, Cl. 354-106.000.

Yamamoto, Haruhisa: *See*—
Akiyama, Shinichi; and Yamamoto, Haruhisa, B 777,679, Cl. 562-532.000.

Yamamoto, Masahiko: *See*—
Kubo, Noriyoshi; Katano, Takeshi; Tatsuzawa, Yoshinobu; Hagihira, Tadatoshi; Yamamoto, Masahiko; and Wasai, Hiromi, B 626,098, Cl. 325-320.000.

Yamamoto, Sigeo: *See*—
Tsuchiya, Hiroshi; Mukai, Kunio; Kimura, Akio; Taya, Hiroshi; Fujimoto, Keimei; Ozaki, Toshiaki; Yamamoto, Sigeo; Ogawa, Taizo; Ooishi, Tadashi; and Okuno, Yositosi, B 768,875, Cl. 424-225.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Okazaki, Kiyoshi; Murakami, Masuo; Kawada, Hiroitsu; Sekino, Jun; Shimizu, Hidemi; and Kawahara, Shigemi, B 686,154, Cl. 424-317.000.

Yamashita, Koichi: *See*—
Tanaka, Shinzo; Tsubamoto, Shinichi; Yamashita, Koichi; Eguchi, Tadashi; and Inoue, Kashirou, B 709,088, Cl. 23-232.00R.

Yamasita, Nobuo; and Imai, Toshihiro, to Olympus Optical Co., Ltd. Single-lens reflex optical system for an endoscope. B 773,408, Cl. 350-172.000.

Yamazaki, Iwao: *See*—
Abe, Kazunobu; Rikimaru, Hiroaki; Yamazaki, Iwao; and Hasegawa, Hiroshi, B 753,323, Cl. 252-455.00R.

Yamazaki, Shunji; and Masuda, Hajime, to Hochiki Corporation. Alarm system. B 833,072, Cl. 340-531.000.

Yamazaki, Takamitsu. Drinking cup cover. B 803,587, Cl. 220-268.000.

Yanagimoto Seisakusho Co., Ltd.: *See*—
Tanaka, Shinzo; Tsubamoto, Shinichi; Yamashita, Koichi; Eguchi, Tadashi; and Inoue, Kashirou, B 709,088, Cl. 23-232.00R.

Yanagioka, Seiichi, to Aikoh Co., Ltd. Baseball bat made of light alloy. B 684,351, Cl. 273-72.00A.

Yano, Shigeru: *See*—
Kataoka, Rikio; Yano, Shigeru; Kumamoto, Yoshito; Watanabe, Haruo; Kaya, Hisao; Aoki, Kiyoshi; and Kitamura, Masanao, B 771,665, Cl. 431-1.000.

Yao, Joe. Photographic camera and film cartridge therefor. B 740,123, Cl. 354-153.000.

Yasoshima, Nobuyuki: *See*—
Nojiri, Shoji; Kanzaki, Hisao; Yasoshima, Nobuyuki; Satake, Yasuo; and Ogawa, Kenichi, B 788,971, Cl. 179-84.00R.

Yasuda, Jun: *See*—
Terada, Yasuhiko; Yasuda, Jun; and Kuriyama, Masao, B 661,825, Cl. 8-120.000.

Yates, Stephen William: *See*—
Lappage, James; Doggett, Neil; and Yates, Stephen William, 4,112,662, Cl. 57-34.0AT.

Yazaki Corporation: *See*—
Shogo, Iizuka; Mitsuo, Endo; Mitsugu, Watanabe; Toshio, Iizuka; and Kenji, Usui, B 737,025, Cl. 219-56.000.

Yeargin, G. Scott: *See*—
Malpass, Dennis B.; and Yeargin, G. Scott, B 805,194, Cl. 260-606.50P.

Yee, Bing S.: *See*—
Frank, Earl E.; and Yee, Bing S., B 724,720, Cl. 210-167.000.

Yench, Charles G. Roof structure for an automobile. B 786,039, Cl. 296-137.00B.

Yevick, George J., to Izon Corporation. Channel illumination sheets. B 714,215, Cl. 350-96.250.

Yevick, George J., to Izon Corporation. Film strip recorder and viewer. B 785,039, Cl. 354-102.000.

Yokohama Rubber Co., Ltd., The: *See*—
Itoh, Hiroyuki; Mitsuhashi, Kenhachi; and Akashi, Hiromitsu, 4,112,746, Cl. 73-95.000.

Yokokawa, Junji: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi;

Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.

Yole, Charles S.: *See*—
Gorham, Michael L.; Heckman, Raymond F.; and Yole, Charles S., B 793,453, Cl. 179-90.00B.

Yoneda, Kenji; Nakazato, Masao; and Yuminaka, Takeo, to Hitachi, Ltd. Elevator control apparatus having a novel hall call allotting device. B 702,145, Cl. 187-29.00R.

Yoneyama, Eiichi: *See*—
Oshio, Hiromichi; Konishi, Hiroyuki; Matsumura, Shiunzi; Ishikawa, Kikuichi; and Yoneyama, Eiichi, B 776,618, Cl. 71-76.000.

Yoshida, Kazumichi: *See*—
Suzuki, Akira; Nakamura, Kantaro; Maejima, Tetsuo; Kajiura, Masaru; Aso, Toshio; Abe, Shoichi; Suzuki, Toshihisa; Takemura, Katsuaki; Kuno, Masaya; Yoshida, Kazumichi; Yokokawa, Junji; Miyasugi, Takeshi; Yagi, Hiroshi; and Mukai, Kiyohisa, B 775,373, Cl. 422-197.000.

Yoshida Kogyo K.K.: *See*—
Kasai, Kazumi, 4,112,554, Cl. 24-205.11R.

Yoshikawa, Ryoichi: *See*—
Tezuka, Nobuo; Uchidoi, Masanori; Iura, Yukio; Shimizu, Masami; Yoshikawa, Ryoichi; and Aizawa, Hiroshi, B 758,200, Cl. 354-238.000.

Yoshikawa, Yoshio; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, to Mitsubishi Gas Chemical Company, Inc. Oxygen absorbent. B 751,668, Cl. 252-428.000.

Yoshinaga, Mayumi: *See*—
Nakada, Tetsuro; Shimizu, Makoto; and Yoshinaga, Mayumi, B 864,252, Cl. 266-137.000.

Yoshino, Shoichi: *See*—
Fukuta, Shigemi; Izaki, Hiroshi; and Yoshino, Shoichi, B 712,068, Cl. 164-286.000.

Yoshio, Hashimoto, to Kabushiki Kaisha Yachiyo Kogyo Kenkyusho. Manipulator. B 805,840, Cl. 214-1.0BB.

Yoshizawa, Isamu; Okubo, Hiroyuki; Isozaki, Hiroshi; Hara, Tsutomu; and Masuda, Bunpei, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Drum type flying shear. 4,112,798, Cl. 83-344.000.

Young, David W.: *See*—
Cotten, Roger C.; Young, David W.; and Kandanian, Aram Y., B 851,764, Cl. 260-897.00A.

Young, Lewis Brewster: *See*—
Kaeding, Warren W.; and Young, Lewis Brewster, B 793,470, Cl. 260-673.000.

Young, Maurice G.: *See*—
Rosenthal, Isadore; Exner, Lawrence J.; Niksa, Gregory J.; Weiss, Warren I.; and Young, Maurice G., 4,112,714, Cl. 68-206.000.

Youngstown Sheet and Tube Company: *See*—
Curtis, William M.; and Hermanson, Dean E., B 790,963, Cl. 285-12.000.

Youngstown Steel Door Company, The: *See*—
Wright, Glenn Lamont; and Ellis, James Arthur, 4,112,540, Cl. 16-99.000.

Yousef, Hosni Labib. Electrical generator employing natural energy to power same. B 766,699, Cl. 290-55.000.

Yuminaka, Takeo: *See*—
Yoneda, Kenji; Nakazato, Masao; and Yuminaka, Takeo, B 702,145, Cl. 187-29.00R.

Yuyama, Megunu: *See*—
Yoshikawa, Yoshio; Amemiya, Akira; Komatsu, Toshio; Inoue, Yoshiaki; and Yuyama, Megumu, B 751,668, Cl. 252-428.000.

Zahn, Edward A. Instrument for measuring the consistency of high-consistency materials. 4,112,742, Cl. 73-54.000.

Zaitsev, Mikhail Ivanovich: *See*—
Eremin, Nikolai Ivanovich; Tager, Semen Alexandrovich; Kostin, Vladimir Nikolaevich; Bobkov, Lev Nikolaevich; Zaitsev, Mikhail Ivanovich; Kaluzhsky, Nikolai Andreevich; Shmorgunenko, Nikolai Stepanovich; Jurovsky, Abram Zinovievich; Kozlov, Viktor Mikhailovich; Yakhilevich, Fritiof Meerovich; Shpirt, Mikhail Yakovlevich; and Panin, Vladlen Iosifovich, B 702,208, Cl. 423-131.000.

Zajac, Edward: *See*—
McCabe, Barkman C.; and Zajac, Edward, 4,112,745, Cl. 60-641.000.

Zanio, Kenneth W.; and Fraas, Lewis M., to Hughes Aircraft Company. Process for fabricating polycrystalline InP-CdS solar cells. B 735,560, Cl. 148-174.000.

Zanotti, Arnaldo: *See*—
Dondi, Gilberto; and Zanotti, Arnaldo, B 743,853, Cl. 424-230.000.

Zapletal, Henry: *See*—
Adams, Elvin E.; Wells, Tom J.; Wentzek, Horst F.; Zapletal, Henry; and Zugel, Marty J., 4,112,726, Cl. 72-137.000.

Zeelen, Filippus Johannes: *See*—
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, B 739,142, Cl. 424-205.000.

Zeh, Werner; and Kuhnlein, Dieter, to Grundig E.M.V. Cassette turning mechanism. B 802,714, Cl. 360-92.000.

Zelinka, Richard J.; and Sutherland, George K., to Sys-Tec, Inc. Heater control for rotary members. B 734,755, Cl. 219-471.000.

Zevco Enterprises, Inc.: *See*—
Marder, William Z., 4,112,790, Cl. 76-87.000.

Zimmermann, Adolf, to AZO-Maschinenfabrik Adolf Zimmermann. Shell silo. 4,112,639, Cl. 52-174.000.

Ziv, Avraham, to American Safety Equipment Corporation. Extended low tension range dual tension safety belt retractor. B 791,477, Cl. 242-107.000.

Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. Polymers flameproofed with 1,2-oxaphospholanes. B 806,044, Cl. 521-108.000.

Zoor, Reinhold, to Heinrich Wunder KG. Safety ski binding. B 746,185, Cl. 280-626.000.

Zoric, Michael T., to Westinghouse Air Brake Company. Emergency portion for a brake control valve. B 749,288, Cl. 303-37.000.

Zugel, Marty J.: *See*—
Adams, Elvin E.; Wells, Tom J.; Wentzek, Horst F.; Zapletal, Henry; and Zugel, Marty J., 4,112,726, Cl. 72-137.000.

Zverkhovsky, Valentin Ivanovich: *See*—
Smirnov, Leonard Fedorovich; Parkhitko, Vladimir Mikhailovich; Zverkhovsky, Valentin Ivanovich; Burtov, Oleg Antonovich; Razuvaev, Nikolai Ivanovich; Dovzhko, Fedor Evdokimovich; Kleiman, Moisha Gershovich; and Dzyan, Valentin Ivanovich, 4,112,702, Cl. 62-123.000.

Zyss, Thadeus B. Method of producing cured low sodium meat products. B 811,165, Cl. 426-264.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF SEPTEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Becker, Otto Alfred. Process for welding sheet metal coated with layers. Re. 29,762, Cl. 219-92.000.

Brown, Paul L.; and Hyde, James Franklin, to Dow Corning Corporation. Polyfunctional alkoxy endblocked polysiloxanes and their cured compositions. Re. 29,760, Cl. 528-41.000.

Cluett, Peabody & Co., Inc.: *See*—
Rockerath, John L.; and Schreck, Harold J., Re. 29,758, Cl. 112-141.000.

Dow Corning Corporation: *See*—
Brown, Paul L.; and Hyde, James Franklin, Re. 29,760, Cl. 528-41.000.

Durant, Graham John; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Guanidino, thioureido and isothioureido derivatives containing imidazole groups. Re. 29,761, Cl. 424-273.00R.

Eastman Kodak Company: *See*—
Stoneham, Jeffrey R., Re. 29,764, Cl. 354-145.000.

Ganellin, Charon Robin: *See*—
Durant, Graham John; and Ganellin, Charon Robin, Re. 29,761, Cl. 424-273.00R.

Helfet, Arthur Jacob. Replacements for bicondylar joints in human limbs. Re. 29,757, Cl. 3-1.910.

Hyde, James Franklin: *See*—
Brown, Paul L.; and Hyde, James Franklin, Re. 29,760, Cl. 528-41.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Kawai, Masanori, Re. 29,763, Cl. 310-344.000.

Kawai, Masanori, to Kabushiki Kaisha Suwa Seikosha. Crystal vibrator mounting. Re. 29,763, Cl. 310-344.000.

Rockerath, John L.; and Schreck, Harold J., to Cluett, Peabody & Co., Inc. Reinforced hem forming device. Re. 29,758, Cl. 112-141.000.

Schreck, Harold J.: *See*—
Rockerath, John L.; and Schreck, Harold J., Re. 29,758, Cl. 112-141.000.

Smith Kline & French Laboratories Limited: *See*—
Durant, Graham John; and Ganellin, Charon Robin, Re. 29,761, Cl. 424-273.00R.

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ISSUED SEPTEMBER 12, 1978

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53	4,112,598

CLASS 36

11.5	4,112,599
91	4,112,600
137	4,112,601

CLASS 37

55	4,112,602

CLASS 40

2 R	4,112,603
610	4,112,604

CLASS 42

1 V	4,112,605
90	4,112,606

CLASS 43

17	4,112,607
42.09	4,112,608
118	4,112,609

CLASS 44

66	4,113,442
72	4,113,443
	4,113,444

CLASS 46

12	4,112,610
47	4,112,611
74 D	4,112,612
83	4,112,613
151	4,112,614
254	4,112,615

CLASS 47

1 R	4,112,616
57.5	4,112,617
58	4,112,618
66	4,112,619

CLASS 48

197 R	4,113,445
202	4,113,446

CLASS 49

8	4,112,620
400	4,112,621
421	4,112,622
488	4,112,623

CLASS 51

5 D	4,112,624
33 W	4,112,625
35	4,112,626
79	4,112,627
140	4,112,628
165.93	4,112,629
281 R	4,112,630
295	4,112,631

CLASS 52

11	4,112,632
66	4,112,633
67	4,112,634
69	4,112,635
98	4,112,636
155	4,112,637
169.12	4,112,638
174	4,112,639
177	4,112,640
179	4,112,641
202	4,112,642
222	4,112,643
245	4,112,644
304	4,112,645
372	4,112,646
481	4,112,647
508	4,112,648
731	4,112,649

CLASS 53

211	4,112,652
412	4,112,650
449	4,112,651

CLASS 55

5	4,113,447
17	4,113,448
96	4,113,449
97	4,113,450
162	4,113,451
203	4,113,452
263	4,113,453
319	4,113,454
378	4,113,455

CLASS 56

12.7	4,112,653
98	4,112,654
301	4,112,655
320.1	4,112,656
330	4,112,657

CLASS 57

34 AT	4,112,662
34 R	4,112,661
51	4,112,658
58.89	4,112,659
	4,112,663
59	4,112,660
77.4	4,112,664
81	4,112,665
105	4,112,666
157 S	4,112,667
	4,112,668

CLASS 58

4 A	4,112,669
23 A	4,112,670
23 D	4,112,671
53	4,112,672
85.5	4,112,673

CLASS 59

72	4,112,674

CLASS 60

39.06	4,112,675
39.71	4,112,676
226 R	4,112,677
276	4,112,678
445	4,112,679
538	4,112,680
539	4,112,681
548	4,112,682
595	4,112,683
606	4,112,684
634	4,112,685
639	4,112,686
641	4,112,687
	4,112,745
669	4,112,688

CLASS 62

3	4,112,699
28	4,112,700
84	4,112,701
123	4,112,702
211	4,112,703
217	4,112,704
238	4,112,705
514 R	4,112,706

CLASS 63

31	4,112,707

CLASS 64

2 R	4,112,708
21	4,112,709
23	4,112,710

CLASS 65

5	4,113,456
11 R	4,113,457
114	4,113,458
135	4,113,459
178	4,113,460
324	4,113,461

CLASS 66

1 A	4,112,711
157	4,112,712

CLASS 68

5 E	4,112,713
206	4,112,714

CLASS 70

38 A	4,112,715
38 C	4,112,716
63	4,112,717
159	4,112,718
233	4,112,720
363	4,112,820

CLASS 71

7	4,113,462
76	4,113,463
88	4,113,464
92	4,113,465

CLASS 72

12	4,112,721
60	4,112,723
63	4,112,724
128	4,112,725
137	4,112,726
142	4,112,727
154	4,112,728
181	4,112,722
236	4,112,729
290	4,112,730
320	4,112,731
334	4,112,732

CLASS 73

12	4,112,733
15 B	4,112,734
19	4,112,735
23	4,112,736
	4,112,737
32 R	4,112,738
38	4,112,739
53	4,112,740
	4,112,741
54	4,112,742
61.1 C	4,112,743
61.1 R	4,112,744
95	4,112,746
116	4,112,747
118	4,112,748
139	4,112,749
141 AB	4,112,750
147	4,112,752
170 R	4,112,753
178 R	4,112,754
	4,112,755
181	4,112,756
207	4,112,757
218	4,112,758
295	4,112,759
299	4,112,760
312	4,112,761
343 R	4,112,762
355 R	4,112,763
362 AR	4,112,764
368.3	4,112,765
422 GC	4,112,766
422 R	4,112,768
425.4 R	4,112,769
	4,112,770
	4,112,771
	4,112,772
455	4,112,774
627	4,112,775
642	4,112,773
665	4,112,776
728	4,112,777

CLASS 74

117	4,112,778
191	4,112,779
	4,112,780
198	4,112,781
217 R	4,112,767
462	4,112,782
470	4,112,783
501.5 R	4,112,784
572	4,112,785
606 R	4,112,786
798	4,112,787
804	4,112,788

CLASS 75

0.5 A	4,113,467
2	4,113,466
12	4,113,468
60	4,113,469
74	4,113,470
101 R	4,113,471
141 A	4,112,751
142	4,113,472
148	4,113,473
156.5	4,113,474
159	4,113,475
166 C	4,113,476
	4,113,477
177	4,113,478
211	4,113,479
214	4,113,480
256	4,113,481

CLASS 76

58	4,112,789
87	4,112,790

CLASS 81

9.5 A	4,112,791
63	4,112,792

CLASS 82

1.3	4,112,793
64	4,112,794

CLASS 83

15	4,112,795
141	4,112,796
177	4,112,797
344	4,112,798
409	4,112,799
411 A	4,112,800
490	4,112,810
586	4,112,801

CLASS 84

1.01	4,112,802
1.24	4,112,803
173	4,112,804
317	4,112,805
390	4,112,806
411 R	4,112,807
453	4,112,808
465	4,112,809

CLASS 85

7	4,112,811
46	4,112,812
74	4,112,813
75	4,112,814
80	4,112,815

CLASS 87

12	4,112,816

CLASS 89

33 B	4,112,817
41 TV	4,112,818

CLASS 90

13.9	4,112,819

CLASS 91

6	4,112,821
29	4,112,822
36	4,112,823
413	4,112,824
447	4,112,825

CLASS 92

13.1	4,112,826

CLASS 93

58.3	4,112,827

CLASS 96

1 PC	4,113,483
1 PS	4,113,482
1 R	4,113,484
5	4,113,485
36	4,113,486
38.1	4,113,487
56	4,113,488
60 R	4,113,489
	4,113,490
66 R	4,113,491
67	4,113,492
	4,113,493
75	4,113,494
100 R	4,113,495
114.1	4,113,496
115 P	4,113,497

CLASS 99

275	4,112,828
277	4,112,829
300	4,112,830
306	4,112,831
421 HH	4,112,832
425	4,112,833
450.1	4,112,834
455	4,112,835
483	4,112,836
537	4,112,837
546	4,112,838

CLASS 100

33 PB	4,112,839

CLASS 101

93.15	4,112,840
141	4,112,841
183	4,112,842

CLASS 102

7.6	4,112,843
19.2	4,112,844
27 R	4,112,845
52	4,112,846
67	4,112,847
69	4,112,848
103	4,112,849

CLASS 104

138 G	4,112,850

CLASS 105

199 C	4,112,851
282 A	4,112,852

CLASS 106

14.13	4,113,498
38.35	4,113,499
39.5	4,113,500
56	4,113,501
67	4,113,502
73.4	4,113,503
97	4,113,504
137	4,113,505
238	4,113,506
287.18	4,113,507
304	4,113,508

CLASS 108

56.1	4,112,854
111	4,112,853
159	4,112,855

CLASS 110

165 R	4,112,856

CLASS 111

3	4,112,857

CLASS 112

141	Re.29,758
158 E	4,112,858
217.1	4,112,859
262	4,112,860

CLASS 114

91	4,112,861
221 R	4,112,862
264	4,112,863
265	4,112,864
270	4,112,865

CLASS 115

34 R	4,112,866

CLASS 118

7 4,112,867
429 4,112,868
623 4,112,869
657 4,112,870

CLASS 119

18 4,112,871
22 4,112,872
29 4,112,873
158 4,112,874

CLASS 123

1 A 4,112,875
3 4,112,876
25 B 4,112,889
32 B 4,112,881
32 EA 4,112,879
32 EE 4,112,880
32 ST 4,112,877
4,112,878
47 A 4,112,882
52 M 4,112,883
90.48 4,112,884
98 4,112,885
103 R 4,112,886
117 A 4,112,888
4,112,891
117 D 4,112,887
117 R 4,112,890
4,112,895
119 A 4,112,892
4,112,894
119 EC 4,112,893
122 D 4,112,896
136 4,112,898
139 AW 4,112,899
4,112,900
139 E 4,112,901
139 ST 4,112,897
140 FG 4,112,902
148 E 4,112,903
4,112,904
169 EL 4,112,905
191 A 4,112,906
193 CH 4,112,907
196 S 4,112,910
198 F 4,112,908
205 Re.29,759

CLASS 124

23 R 4,112,909
56 4,112,911

CLASS 126

41 R 4,112,912
120 4,112,913
121 4,112,914
4,112,915
261 4,112,916
270 4,112,917
4,112,918
4,112,919
271 4,112,920
4,112,921
4,112,922

CLASS 127

29 4,113,509

CLASS 128

1.3 4,112,923
2 F 4,112,924
4,112,925
2 S 4,112,926
2 V 4,112,927
2.05 M 4,112,929
2.05 R 4,112,928
2.06 E 4,112,941
2.06 R 4,112,930
2.08 4,112,931
3 4,112,932
11 4,112,933
12 4,112,934
24.1 4,112,943
69 4,112,935
136 4,112,936
142 R 4,112,938
186 4,112,939
188 4,112,940
214 R 4,112,944
218 D 4,112,945
225 4,112,942
253 4,112,946
276 4,112,948
278 4,112,947
4,112,949
303.14 4,112,950
346 4,112,951
418 4,112,952
419 P 4,112,953

CLASS 131

21 R 4,112,954

CLASS 134

2 4,113,510
10 4,113,511
57 R 4,112,955
141 4,112,937

CLASS 135

1 D 4,112,956
5 A 4,112,958
5 C 4,112,957

CLASS 137

85 4,112,960
102 4,112,961
119 4,112,962
148 4,112,963
205.5 4,112,964
219 4,112,965
282 4,112,966
375 4,112,967
427 4,112,968
454.2 4,112,969
489.5 4,112,970
504 4,112,959
508 4,112,971
597 4,112,972
625.21 4,112,973
625.29 4,112,974
4,112,975
636.2 4,112,976
812 4,112,977

CLASS 138

30 4,112,978
89 4,112,979

CLASS 139

92 4,112,980
102 4,112,981
425 A 4,112,982
446 4,112,983

CLASS 141

98 4,112,984

CLASS 144

193 A 4,112,985
323 4,112,986
4,112,987

CLASS 145

50 D 4,112,988

CLASS 148

1.5 4,113,512
4,113,513
4,113,514
4,113,515
4,113,516
2 4,113,517
6.15 R 4,113,519
6.15 Z 4,113,518
6.27 4,113,520
6.35 4,113,521
11.5 R 4,113,522
12.3 4,113,523
23 4,113,524
4,113,525
4,113,526
36 4,113,527
105 4,113,528
111 4,113,529
113 4,113,530
174 4,113,531
4,113,532
187 4,113,533

CLASS 150

1 4,112,989
3 4,112,990
28 A 4,112,991

CLASS 151

29 4,112,992
41.74 4,112,993
54 4,113,227

CLASS 152

354 R 4,112,994

CLASS 156

56 4,113,534
148 4,113,535
218 4,113,536
247 4,113,538
306 4,113,539
327 4,113,540
330 4,113,541
335 4,113,542
345 4,113,543
384 4,113,544
392 4,113,545
431 4,113,546
612 4,113,547
622 4,113,548
639 4,113,549
656 4,113,550
662 4,113,551

CLASS 159

27 A 4,113,552

CLASS 160

126 4,112,995
296 4,112,996

CLASS 162

34 4,113,553
123 4,113,554
127 4,113,555
272 4,113,556
301 4,113,557

CLASS 164

119 4,112,997
136 4,112,998
154 4,112,999
227 4,113,000
255 4,113,001
286 4,113,002
446 4,113,003

CLASS 165

3 4,113,004
40 4,113,005
76 4,113,006
81 4,113,007
95 4,113,008
154 4,113,009

CLASS 166

213 4,113,010
264 4,113,012
273 4,113,011
275 4,113,013
295 4,113,014
4,113,015
297 4,113,016
303 4,113,017
334 4,113,018

CLASS 169

12 4,113,019
26 4,113,020
37 4,113,021

CLASS 171

61 4,113,022
63 4,113,023

CLASS 172

59 4,113,024
4,113,025
4,113,026
70 4,113,027
178 4,113,028
272 4,113,029
566 4,113,030
667 4,113,031
781 4,113,032

CLASS 173

1 4,113,033
49 4,113,034
116 4,113,035

CLASS 174

42 4,113,979
52 R 4,113,980
88 R 4,113,981
158 R 4,113,982

CLASS 175

11 4,113,036
207 4,113,037
300 4,113,038

CLASS 176

30 4,113,558
38 4,113,559
4,113,560
4,113,561
40 4,113,562
84 4,113,563
87 4,113,564

CLASS 177

25 4,113,039
211 4,113,040

CLASS 179

1 GQ 4,113,984
1 VL 4,113,983
2 A 4,113,986
2 R 4,113,985
15 AN 4,113,987
18 ES 4,113,988
18 GF 4,113,989
84 R 4,113,990
90 B 4,113,991
4,113,992
4,113,993
100.1 DR 4,113,994
146 R 4,113,995
170 NC 4,113,996
170.2 4,113,997
175.3 R 4,113,998
179 4,113,999

CLASS 180

14 C 4,113,041
19 H 4,113,042
33 A 4,113,043
51 4,113,044
65 C 4,113,045
65 D 4,113,047
105 E 4,113,046

CLASS 181

220 4,113,048
230 4,113,049
4,113,050
4,113,052
231 4,113,051
284 4,113,053

CLASS 182

2 4,113,054
63 4,113,055
153 4,113,056
187 4,113,057
4,113,058

CLASS 184

1 D 4,113,059
6 4,113,060
41 4,113,061

CLASS 185

10 4,113,062
40 R 4,113,063

CLASS 187

1 R 4,113,064
18 4,113,065
29 R 4,113,066

CLASS 188

71.6 4,113,067
72.5 4,113,068
72.7 4,113,069
196 F 4,113,070
282 4,113,071
4,113,072
364 4,113,073

CLASS 191

67 4,113,074

CLASS 192

3.31 4,113,075
4 A 4,113,076
098 4,113,077
107 C 4,113,078
129 B 4,113,079
150 4,113,080

CLASS 195

31 F 4,113,565
36 P 4,113,566
63 4,113,567
68 4,113,568

CLASS 198

339 4,113,082
480 4,113,083
731 4,113,084

CLASS 200

16 R 4,114,000
50 A 4,114,001
67 C 4,114,002
144 R 4,114,003
148 A 4,114,004
153 G 4,114,005
234 4,114,006
246 4,114,007

CLASS 201

39 4,113,569

CLASS 202

139 4,113,570
176 4,113,571
227 4,113,572

CLASS 203

2 4,113,573
8 4,113,574
62 4,113,575

CLASS 204

13 4,113,576
15 4,113,577
4,113,578
33 4,113,579
37 T 4,113,580
39 4,113,581
4,113,582
55 Y 4,113,583
64 R 4,113,584
98 4,113,585
105 R 4,113,586
129.1 4,113,587
151 4,113,588
157.1 R 4,113,589
158 HA 4,113,590
159.15 4,113,591
4,113,593
4,113,594
159.16 4,113,592
159.17 4,113,595
180 R 4,113,596
181 C 4,113,597
181 R 4,113,598
192 P 4,113,599
197 4,113,600
230 4,113,601

CLASS 206

45.14 4,113,086
174 4,113,087
210 4,113,088
319 4,113,089
365 4,113,090
387 4,113,091
388 4,113,750
408 4,113,092
423 4,113,093
4,113,094
508 4,113,095
523 4,113,096
528 4,113,097
540 4,113,098
575 4,113,099
602 4,113,100
606 4,113,101
611 4,113,102
4,113,103
626 4,113,104

CLASS 208

8 4,113,602
89 4,113,603
206 4,113,604
216 4,113,605
244 4,113,606
254 R 4,113,607

CLASS 209

1 4,113,608
167 4,113,106
215 4,113,611
549 4,113,105
609 4,113,609
705 4,113,610

CLASS 210

17 4,113,612
4,113,613
22 A 4,113,614
40 4,113,615
67 4,113,616
72 4,113,617
82 4,113,618
96 R 4,113,619
152 4,113,620
167 4,113,621
4,113,622
4,113,623
219 4,113,624
321 B 4,113,625
409 4,113,626
446 4,113,627
500 M 4,113,628
522 4,113,629

CLASS 211

4 4,113,107
43 4,113,108
49 R 4,113,109
191 4,113,110

CLASS 212

28 4,113,111
71 4,113,112

CLASS 213

43 4,113,113
75 R 4,113,114

CLASS 214

1 BB 4,113,115
1 HA 4,113,116
8.5 C 4,113,117
10.5 R 4,113,118
16.4 A 4,113,119
38 D 4,113,120
75 R 4,113,121
82 4,113,122
141 4,113,123
147 G 4,113,124
302 4,113,125
450 4,113,126
4,113,127
750 4,113,128

CLASS 215

1 C 4,113,129

CLASS 219

10.41 4,114,010
10.49 R 4,114,009
10.55 D 4,114,013
10.55 M 4,114,011
10.55 R 4,114,012
56 4,114,014
69 W 4,114,015
90 4,114,017
92 Re.29,762
97 4,114,016
121 LM 4,114,018
137 R 4,114,019
4,114,020
216 4,114,021
362 4,114,022
471 4,114,023
489 4,114,024

CLASS 220

5 A 4,113,130
19 4,113,131
71 4,113,132
74 4,113,133
256 4,113,134
268 4,113,135
276 4,113,136
319 4,113,137
367 4,113,138

CLASS 221

1 4,113,139
6 4,113,140
70 4,113,141
171 4,113,142
267 4,113,143

CLASS 222

1 4,113,145
105 4,113,146
131 4,113,147
139 4,113,148
181 4,113,149
243 4,113,150
324 4,113,151
396 4,113,144
485 4,113,152
571 4,113,153

CLASS 223

24 4,113,154
102 4,113,155

CLASS 224

5 R 4,113,156
26 E 4,113,157
39 4,113,158
45 R 4,113,160
45 S 4,113,159
46 R 4,113,161

CLASS 225

2 4,113,162

CLASS 227

10 4,113,163
124 4,113,164

CLASS 228

36 4,113,165
170 4,113,166
176 4,113,167

CLASS 229

37 R 4,113,168
53 4,113,169

CLASS 232

35 4,113,170

CLASS 233

7 4,113,171
11 4,113,172
25 4,113,173

CLASS 235

96 4,114,025
375 4,114,026
419 4,114,027
449 4,114,029
458 4,114,028
464 4,114,030
474 4,114,031
493 4,114,032
494 4,114,033

CLASS 236

12 A 4,113,174
46 A 4,113,175
49 4,113,176

CLASS 238

72 4,113,177
349 4,113,178

CLASS 239

109 4,113,180
206 4,113,181
304 4,113,182
533.13 4,113,183

CLASS 241
15 4,113,184
21 4,113,185
24 4,113,186
4,113,187
37.5 4,113,188
43 4,113,189
92 4,113,190
188 A 4,113,191

CLASS 242
1 4,113,192
18 R 4,113,193
43 R 4,113,194
55.3 4,113,195
56 R 4,113,196
58.1 4,113,197
78.3 4,113,198
106 4,113,199
107 4,113,200
4,113,201

CLASS 243
33 4,113,202

CLASS 244
3.11 4,113,203
3.21 4,113,204
20 4,113,205
31 4,113,206
137 P 4,113,207
139 4,113,208
153 A 4,113,209
219 4,113,210

CLASS 246
169 A 4,113,211

CLASS 248
13 4,113,212
128 4,113,213
146 4,113,214
183 4,113,215
204 4,113,216
221.3 4,113,217
291 4,113,218
354 R 4,113,219
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4,112,551	4,113,349	04 : 4,112,920	4,114,080	4,113,114	4,113,100
4,112,581	4,113,363	4,113,120	4,114,093	4,113,155	4,113,109
4,112,591	4,113,387	4,113,127	4,114,114	4,113,183	4,113,110
4,112,603	4,113,405	4,113,401	4,114,115	4,113,184	4,113,124
4,112,607	4,113,408	4,114,186	4,114,133	4,113,364	4,113,152
4,112,614	4,113,452	05 : 4,112,650	4,114,134	4,113,415	4,113,206
4,112,617	4,113,505	4,113,995	4,114,135	4,113,433	4,113,207
4,112,622	4,113,520	4,114,074	4,114,144	4,113,573	4,113,212
4,112,627	4,113,522	4,114,111	4,114,149	4,113,614	4,113,243
4,112,645	4,113,525	06 : 4,112,595	4,114,156	4,113,708	4,113,250
4,112,647	4,113,526	4,112,697	4,114,164	4,113,949	4,113,251
4,112,693	4,113,531	4,112,711	4,114,171	4,114,000	4,113,269
4,112,695	4,113,567	4,112,745	4,114,183	4,114,031	4,113,326
4,112,715	4,113,576	4,112,846	4,114,187	13 : 4,112,561	4,113,331
4,112,716	4,113,589	4,112,849	08 : 4,112,758	4,112,811	4,113,333
4,112,720	4,113,606	4,112,855	4,113,245	4,112,837	4,113,338
4,112,738	4,113,693	4,112,864	4,113,311	4,112,838	4,113,340
4,112,748	4,113,735	4,112,875	4,113,313	4,112,857	4,113,352
4,112,774	4,113,775	4,112,892	09 : 4,112,566	4,112,860	4,113,402
4,112,785	4,113,829	4,112,909	4,112,797	4,112,908	4,113,426
4,112,793	4,114,012	4,112,916	4,112,862	4,113,061	4,113,443
4,112,803	4,114,132	4,112,937	4,112,918	4,113,339	4,113,464
4,112,832	4,114,140	4,112,986	4,112,933	4,113,994	4,113,485
4,112,833	8 : 4,112,753	4,113,011	4,113,145	4,114,167	4,113,502
4,112,845	4,112,950	4,113,059	4,113,389	16 : 4,112,963	4,113,509
4,112,912	4,113,235	4,113,065	4,113,566	4,113,616	4,113,538
4,112,957	4,113,381	4,113,082	4,113,623	4,113,812	4,113,552
4,112,967	4,113,399	4,113,098	4,113,653	17 : 4,112,556	4,113,565
4,112,972	4,113,467	4,113,156	4,113,696	4,112,574	4,113,597
4,112,992	4,113,479	4,113,177	4,113,723	4,112,599	4,113,600
4,112,993	4,114,011	4,113,180	4,113,942	4,112,605	4,113,604
4,113,051	9 : 4,112,579	4,113,257	4,114,043	4,112,621	4,113,617
4,113,056	4,112,677	4,113,297	4,114,116	4,112,654	4,113,640
4,113,096	4,112,786	4,113,335	10 : 4,113,086	4,112,703	4,113,659
4,113,135	4,112,991	4,113,343	4,113,462	4,112,718	4,113,677
4,113,137	4,113,186	4,113,386	4,113,585	4,112,777	4,113,713
4,113,149	4,113,191	4,113,394	4,113,681	4,112,804	4,113,765
4,113,153	4,113,199	4,113,494	4,113,688	4,112,816	4,113,787
4,113,179	4,113,268	4,113,549	4,113,724	4,112,821	4,113,793
4,113,196	4,113,397	4,113,577	4,113,763	4,112,828	4,113,834
4,113,200	4,113,472	4,113,590	4,113,794	4,112,852	4,113,840
4,113,201	4,113,504	4,113,594	12 : 4,112,525	4,112,853	4,113,894
4,113,209	4,113,541	4,113,605	4,112,585	4,112,926	4,113,899
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4,113,222	4,113,641	4,113,661	4,112,619	4,112,961	4,113,986
4,113,252	4,113,766	4,113,662	4,112,652	4,112,966	4,113,996

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DESIGN PATENTS

6	:	249,386			249,355			249,360			249,357	39	:	249,318			249,339
8	:	249,323			249,363		20	:	249,375		249,392			249,321	47	:	249,310
		249,324			249,377		21	:	249,361	36	: 249,298			249,349	48	:	249,299
9	:	249,391			249,378		26	:	249,356		249,307			249,381			249,312
04	:	249,338			249,384		27	:	249,352		249,313			249,382			249,344
06	:	249,297	08	:	249,306				249,367		249,325			249,383			249,347
		249,305	09	:	249,336		29	:	249,341		249,327			249,395			249,354
		249,334			249,394				249,358		249,329	40	:	249,387			249,388
		249,340	12	:	249,308				249,376		249,364	41	:	249,385	51	:	249,353
		249,343			249,309		34	:	249,316		249,368	42	:	249,322			249,365
		249,345	13	:	249,301				249,320		249,379	44	:	249,311	55	:	249,304
		249,346	17	:	249,333				249,328		249,380			249,337			249,317
		249,351			249,350												

PLANT PATENTS

06	: 4,301	41	: 4,300	54	: 4,299			

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